New Rules in TM Cases

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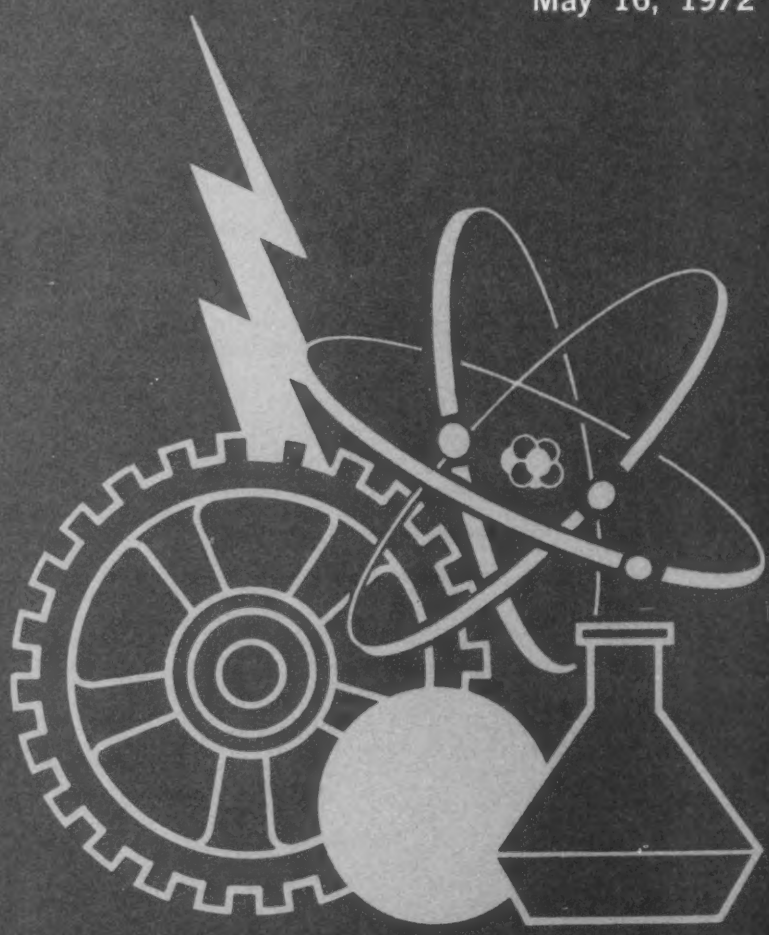

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PATENT OFFICE NOTICES

New Sole-Joint Declaration Form

The sole declaration form, PO–1147, announced by the notice of May 28, 1971 (887 O.G. 1840) has been revised to permit its use in either sole or joint inventor applications. The revised form comprises two pages to provide space for the additional information. In most applications, only page 1 will be necessary, in which case only that page need be signed and submitted. Page 2 would be used only where insufficient space is available on page 1 to fully furnish the required information. If page 2 is used, page 1 need not be signed, and *all* signatures should appear on page 2.

Where appropriate, the present "sole" declaration form may be used.

Specific instructions appear on the form.

Single copies of the new form are available without charge for direct use or for reproduction purposes and may be picked up from the receptionist in Building No. 3 of the Patent Office at Crystal Plaza. Written requests for the form will be filled only if directed to the Commissioner of Patents, Office of Information Services, Washington, D.C., 20231. A stamped, self-addressed envelope must be enclosed.

RICHARD A. WAHL,
Apr. 17, 1972. *Assistant Commissioner.*

Notice to Official Gazette Subscribers

It has come to the attention of the Patent Office that some subcribers to the OFFICIAL GAZETTE have not been receiving all of their copies of the patent and/or trademark sections of the OFFICIAL GAZETTE. Several of the incidents brought to our attention involved situations where subscribers had recently renewed their subscriptions.

This matter was brought to the attention of the Superintendent of Documents who advised us that subscribers to the OFFICIAL GAZETTE are notified approximately 3 months in advance that their subscriptions are about to expire. It was indicated that if these notices are promptly utilized to renew subscriptions, no difficulties will arise.

However, in order to facilitate the resolution of any problems which may arise concerning subscriptions to the OFFICIAL GAZETTE, an official liaison has been established between the Patent Office and the Superintendent of Documents. Under this arrangement, any person experiencing difficulties in obtaining copies of the OFFICIAL GAZETTE should contact Robert Rish, Director, Office of Public Services, U.S. Patent Office, Washington, D.C., 20231. All such inquiries will be given prompt attention.

ROBERT GOTTSCHALK,
Apr. 18, 1972. *Commissioner of Patents.*

TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

Chapter I—Patent Office, Department of Commerce

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Trademark Inter Partes Procedure

A proposal was published at 36 F.R. 18002 to revise, amend, redesignate, or revoke §§ 2.99, 2.104, 2.112, 2.117, 2.119, 2.120, 2.122–2.125, and 2.127–2.129 of the Rules of Practice in Trademark Cases. Pursuant to the notice, written comments have been received and a public hearing was held October 22, 1971. Full consideration has been given to all matter presented and changes in the text of the original proposal have been made in view thereof.

Amendments to the present text of the rules are described below. In cases where the amendment differs from that set forth in the notice of proposed rule making, that change is also described below.

Sections 2.104 and 2.112 are being revised by adopting langage from the Federal rules requiring a short and plain statement showing how the party would be damaged. The proposal required a statement "tending to show why" the party would be damaged.

Section 2.117 is being redesignated as § 2.116 and is being revised to clarify the applicability of the Federal Rules of Civil Procedure to Patent Office proceedings.

A new § 2.117 authorizing suspension of proceedings by the Trademark Trial and Appeal Board when the parties are engaged in civil litigation which may be dispositive of the case, has been added. The new rule gives the Board discretion in matters of suspension whereas the proposed rule required a mandatory suspension.

Section 2.119 is being amended by incorporating the substance of § 1.248 in a new paragraph.

Section 2.120 is being revised to adopt the Federal Rules of Civil Procedure insofar as they are applicable to Patent Office proceedings. The numbers of the applicable Federal rules are not listed since they are incorporated by reference in § 2.120. For example, § 2.120(a)(3) as adopted does not refer to Federal Rule 32 which governs use of discovery depositions.

Section 2.120(a) sets forth restrictions on deposition procedures, discovery of a foreign party and use of discovery depositions.

Existing § 2.120(b) is being deleted and the proposed paragraph is not being adopted. Rule 36 of the Federal Rules of Civil Procedure will govern requests for admissions. A new paragraph (b) governing use of admissions and answers to interrogatories is being adopted.

Existing § 2.120 paragraphs (c) through (e) are being deleted.

Section 2.120(f) is also deleted and proposed § 2.120(c) is not being adopted. Rule 33 of the Federal Rules of Civil Procedure will govern the interrogatory practice. It is believed that the Federal rule will provide uniformity in practice and a body of law which will serve as a guideline to both attorneys and the Board. Some comments were received, however, which expressed a preference for limited interrogatories. In view of such comments, the Office plans to evaluate on a continuing basis the effectiveness and utilization of Federal Rule 33. If instances arise in which Rule 33 does not appear to be fully satisfactory, it may be that consideration will be given to a more limited practice.

A new § 2.120(c) entitled "Failure to Make Discovery: Sanctions" has been added.

Section 2,122(b) is being revised to state that before a pleaded registration will be received in evidence, two copies of the registration showing its status and title or an order for such copies must accompany the opposition or petition to cancel.

Section 2.123(c) relating to printed publications and official records, is being redesignated as § 2.122(c) and revised to incorporate § 1.282 (Patent Rule 282).

A new § 2.122(d) is being added and incorporates the substance of § 1.283 (Patent Rule 283).

Section 2.123 has been completely revised to incorporate the provisions of §§ 1.273–1.281, 1.285, and 1.286 (Patent Rules 273–281, 285, and 286). Portions of the Patent Rules which are not applicable to trademark practice have been omitted and in some instances the Federal Rules of Civil Procedure apply. A few changes have been made in this section as originally propsed; they are as follows:

The title of § 2.123 is being amended by inserting the word "trial" before "testimony."

Proposed § 2.123(e)(5) is being revised to permit a witness to sign a deposition before any officer authorized to administer oaths.

Proposed § 2.123(f)(5) is being deleted and § 2.123(f)(6) is being redesignated as § 2.123(f)(5).

Section 2.124(b) is being amended to require testimony by written questions to be prepared with each answer preceded by its corresponding question.

Section 2.124a is being revoked. Testimony in foreign countries will be covered in § 2.124(d) which provides that such testimony will be taken by depositions upon written questions.

Reference numbers in § 2.125 have been changed and the reference to "the original transcript" in the second sentence

of paragraph (a) is being changed to read "the certified transcript."

Section 2.127(a) provides that the Trademark Trial and Appeal Board may treat a motion as conceded when a party fails to file a brief in opposition to the motion. Sections 2.127 (b) and 2.129(c) are amended by adding a sentence requiring briefs in opposition to petitions for reconsideration to be filed within 15 days.

Section 2.128(b) includes certain changes with respect to the form required for briefs.

In consideration of the comments and pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123) and section 6 of the Act of July 19, 1952 (66 Stat. 793, 35 U.S.C. 6), Part 2 of Chapter I of Title 37 of the Code of Federal Regulations is hereby amended as follows:

1. In § 2.99, a new paragraph (d) is added and reads as follows:

§ 2.99 *Application to register as concurrent user.*

* * * * *

(d) When concurrent registration is sought on the basis of a court determination of the rights of the parties to use the marks in commerce, the application shall be examined by the Examiner of Trademarks. If the applicant is entitled to registration subject only to the concurrent lawful use of a party to the court proceeding, the Examiner of Trademarks may publish or allow the application, provided the court decree specifies the rights of the parties.

2. Section 2.104 is revised to read as follows:

§ 2.104 *Contents of opposition.*

The opposition must set forth a short and plain statement showing how the opposer would be damaged by the registration of the opposed mark and state the grounds for opposition. A duplicate copy of the opposition including exhibits shall be filed.

3. Section 2.112 is revised to read as follows:

§ 2.112 *Petition for cancellation.*

The petition to cancel, which must be verified, or include a declaration in accordance with § 2.20, must set forth a short and plain statement showing how the petitioner is or will be damaged by the registration, state the grounds for cancellation, and indicate the respondent party to whom notice shall be sent. A duplicate copy of the petition, including exhibits, shall be filed with the petition. Applications to cancel different registrations owned by the same party may be joined in one petition when appropriate, but the fee for each application to cancel a registration must accompany the petition.

4. Section 2.117 is redesignated as § 2.116 and paragraph (a) is revised as amended, § 2.116 reads as follows:

§ 2.116 *Federal Rules of Civil Procedure.*

(a) Except as otherwise provided, and wherever applicable and appropriate, procedure and practice in inter partes proceedings shall be governed by the Federal Rules of Civil Procedure.

* * * * *

5. A new § 2.117 is added and reads as follows:

§ 2.117 *Suspension of proceedings.*

Whenever it shall come to the attention of the Trademark Trial and Appeal Board that parties to a pending case are engaged in a civil action which may be dispositive of the case, proceedings before the Board may be suspended until termination of the civil action.

6. Section 2.119 is amended as follows: Paragraph (a) is revised, paragraph (b) is redesignated as paragraph (c), and a new paragraph (b) is added. As amended, § 2.119 reads as follows:

§ 2.119 *Service of papers.*

(a) Every paper filed in the Patent Office in inter partes cases, including notice of appeal, must be served upon the other parties except the notice of interference (§ 2.93), the notice of opposition (§ 2.105), the petition for cancellation (§ 2.113), and the notice of a concurrent use proceeding (§ 2.99), which are mailed by the Patent Office. Proof of such service must be made before the paper will be considered by the Office. A statement signed by the attorney or agent, attached to or appearing on the original paper when filed, clearly stating the date and manner in which service was made will be accepted as prima facie proof of service.

(b) Service of papers must be on the attorney or agent of the party if there be such or on the party if there is no attorney or agent, and may be made in either of the following ways: (1) by delivering a copy of the paper to the person served; (2) by leaving a copy at the usual place of business of the person served, with someone in his employment; (3) when the person served has no usual place of business, by leaving a copy at his residence, with a member of his family over 14 years of age and of discretion; (4) transmission by first-class mail, which may also be certified or registered. Whenever it shall be satisfactorily shown to the Commissioner that none of the above modes of obtaining service or serving the paper is practicable, service may be by notice published in the OFFICIAL GAZETTE.

(c) When service is made by mail, the date of mailing will be considered the date of service. Whenever a party is required to take some action within a prescribed period after the service of a paper upon him by another party and the paper is served by mail, 5 days shall be added to the prescribed period.

7. Section 2.120 is revised to read as follows:

§ 2.120 *Discovery procedure.*

The provisions of the Federal Rules of Civil Procedure relating to discovery shall apply in inter partes trademark cases except as otherwise provided in this section. The Trademark Trial and Appeal Board will specify the closing date for the taking of discovery.

(a) *Depositions for discovery*—(1) *Procedure.* The deposition of a person shall be taken in the Federal judicial district where he resides or is regularly employed. The responsibility for securing the attendance of a propose deponent, other than a party or anyone who at the time set for the taking of the deposition was an officer, director, or managing agent of a party, or a person designated under Rule 30(b)(6) or 31(a) of the Federal Rules of Civil Procedure to testify on behalf of a party, rests wholly with the interested party. See 35 U.S.C. 24.

(2) *Discovery of foreign party.* The discovery deposition of a party or an officer, director, or managing agent of a party, or a person designated under Rule 30(b)(6) or 31(a) of the Federal Rules of Procedure to testify on behalf of a party, domiciled in a foreign country may be taken in the manner prescribed by § 2.124.

(3) *Use of discovery depositions.* A discovery deposition shall not be considered as part of the record in the case unless the party offering the deposition, or any part thereof, files the same before the close of his testimony period (testimony-in-chief or rebuttal as appropriate) and also files a notice of reliance thereon. A discovery deposition should not be filed in the Patent Office in the absence of a notice of reliance. Objections, including any made during the examination, will be considered only if made or renewed at the hearing.

(b) *Use of admission or answer to interrogatory.* No admission or answer to an interrogatory shall be considered as part of the record in the case unless the party propounding the request for admission or interrogatory files, before the close of his testimony period (testimony-in-chief or rebuttal, as appropriate), a copy of the admission and the request therefor and/or a copy of the interrogatory and its answer and also files a notice of reliance thereon.

(c) *Failure to make discovery: Sanctions.* If any party fails or refuses to answer any proper question in taking discovery depositions or fails or refuses to answer any proper question propounded by interrogatories or fails or refuses to comply with a request to produce and permit the inspection and copying of designated things, the party seeking discovery may apply to the Trademark Trial and Appeal Board for an order compelling discovery. If a party or an officer, director, or managing agent of a party, or a person designated under Rule 30(b)(6) or 31(a) of the Federal Rules of Civil Procedure to testify on behalf of a party, fails to obey an order to provide or permit discovery, the Trademark Trial and Appeal Board may strike out all or any part of any pleading of that party, dismiss the action or proceeding, or deny any part thereof,

enter judgment as by default against that party or take any such other action as may be deemed appropriate.

8. In § 2.122, paragraph (b) is revised and new paragraphs (c) and (d) are added. As amended, those paragraphs of § 2.122 read as follows:

§ 2.122 *Matters in evidence.*

* * * * *

(b) A registration of the opposer or petitioner pleaded in an opposition or petition to cancel will be received in evidence and made part of the record if two copies showing status and title of the printed registration or an order for such copies accompany the opposition or petition.

(c) Printed publications, such as books and periodicals, available to the general public in libraries or of general circulation, and official records, if competent evidence and pertinent to the issue, may be introduced in evidence by filing in the Patent Office a notice to that effect during the period for the taking of the testimony of the party (during the period for taking of testimony-in-chief if such matters are not in rebuttal), specifying the record or the printed publication, the page or pages to be used, indicating generally its relevance, and accompanied by the record or authenticated copy or the printed publication or a copy. When a copy of an official record of the Patent Office is filed, it need not be a certified copy. The notice and copy of the record or publication must be served on each of the other parties.

(d) Upon motion duly made and granted, testimony taken in another proceeding, or testimony taken in a suit between the same parties or those in interest, may be used in a proceeding, so far as relevant and material, subject, however, to the right of any contesting party to recall or demand the recall of witnesses whose testimony has been taken, and to take other testimony in rebuttal of the testimony.

§ 2.123 *Trial testimony in inter partes cases.*

(a) Manner of taking testimony: Testimony of witnesses in inter partes cases may be taken (1) by depositions upon oral examination as provided by this section, or (2) by depositions upon written questions in accordance with the requirements of this section and § 2.124.

(b) Stipulations: If the parties so stipulate in writing, depositions may be taken before any person authorized to administer oaths, at any place, upon any notice, and in any manner and when so taken may be used like other depositions. By agreement of the parties, the testimony of any witness or witnesses of any party, may be submitted in the form of an affidavit by such witness or witnesses. The parties may stipulate what a particular witness would testify to if called, or the facts in the case of any party may be stipulated.

(c) Notice of examination of witnesses: Before the depositions of witnesses shall be taken by a party, due notice in writing shall be given to the opposing party or parties, as provided in § 2.119(b), of the time when and place where the depositions will be taken, of the cause or matter in which they are to be used, and the name and address of each witness to be examined; if the name of a witness is not known, a general description sufficient to identify him or the particular class or group to which he belongs, together with a satisfactory explanation, may be given instead. Neither party shall take depositions in more than one place at the same time, nor so nearly at the same time that reasonable opportunity for travel from one place of examination to the other is not available.

(d) Persons before whom depositions may be taken: Depositions may be taken before persons designated by Rule 28 of the Federal Rules of Civil Procedure.

(e) Examination of witnesses:

(1) Each witness before testifying shall be duly sworn according to law by the officer before whom his deposition is to be taken.

(2) The deposition shall be taken in answer to questions, with the questions and answers recorded in their regular order by the officer, or by some other person (who shall be subject to the provisions of Rule 28 of the Federal Rules of Civil Procedure) in the presence of the officer except when his presence is waived on the record by agreement of the parties. The Testimony shall be taken stenographically and transcribed, unless the parties present agree otherwise. In the absence of all opposing parties and their attorneys or agents, depositions may be taken in longhand, typewriting, or stenographically.

(3) The opposing party shall have full opportunity to cross-examine the witnesses. If the opposing party shall attend the examination of witnesses not named in the notice, and shall either cross-examine such witnesses or fail to object to their examination, he shall be deemed to have waived his right to object to such examination for want of notice.

(4) All objections made at the time of the examination to the qualifications of the officer taking the deposition, or to the manner of taking it, or to the evidence presented, or to the conduct of any party, and any other objection to the proceedings, shall be noted by the officer upon the deposition. Evidence objected to shall be taken subject to the objections.

(5) When the deposition has been transcribed, the deposition shall be carefully read over by the witness or by the officer to him, and shall then be signed by the witness in the presence of any officer authorized to administer oaths unless the reading and the signature be waived on the record by agreement of all parties.

(f) Certification and filing by officer. The officer shall annex to the deposition his certificate showing:

(1) Due administration of the oath by the officer to the witness before the commencement of his deposition;

(2) The name of the person by whom the deposition was taken down, and whether, if not taken down by the officer, it was taken down in his presence;

(3) The presence or absence of the adverse party;

(4) The place, day, and hour of commencing and taking the deposition;

(5) The fact that the officer was not disqualified as specified in Rule 28 of the Federal Rules of Civil Procedure.

If any of the foregoing requirements are waived, the certificate shall so state. The officer shall sign the certificate and affix thereto his seal of office, if he has such a seal. Unless waived on the record by agreement, he shall then, without delay, securely seal in an envelope all the evidence, notices, and paper exhibits, inscribed upon the envelope a certificate giving the number and title of the case, the name of each witness, and the date of sealing, address the package, and forward the same to the Commissioner of Patents. If the weight or bulk of an exhibit shall exclude it from the envelope, it shall, unless waived on the record by agreement of all parties, be authenticated by the officer and transmitted in a separate package marked and addressed as provided in this section.

(g) Form of deposition:

(1) The pages of each deposition must be numbered consecutively, and the name of the witness plainly and conspicuously written at the top of each page. The deposition may be written on legal-size or letter-size paper, with a wide margin on the left hand side of the page, and with the writing on one side only of the sheet. The questions propounded to each witness must be consecutively numbered and each question must be followed by its answer.

(2) Exhibits must be numbered or lettered consecutively and each must be marked with the number and title of the case and the name of the party offering the exhibit. Entry and consideration may be refused to improperly marked exhibits.

(h) Depositions must be filed. All depositions which are taken must be duly filed in the Patent Office. On refusal to file, the Office at its discretion will not further hear or consider the contestant with whom the refusal lies; and the Office may, at its discretion, receive and consider a copy of the withheld deposition, attested by such evidence as is procurable.

(i) Inspection of depositions: After the depositions are filed in the Office, they may be inspected by any party to the case, but they cannot be withdrawn for the purpose of printing. They may be printed by someone specially designated by the Office for that purpose, under proper restrictions.

(j) Effect of errors and irregularities in depositions: Notice will not be taken of merely formal or technical objections which shall not appear to have wrought a substantial injury to the party raising them; and in the case of such injury it must be made to appear that, as soon as the party became aware of the ground of objection, he gave notice thereof. Rule 32(d)(1), (2), and (3)(a) and (b) of the Federal Rules of Civil Procedure shall apply to errors and irregularities in depositions.

(k) Objections to admissibility: Subject to the provisions of paragraph (j) of this section, objection may be made to receiving in evidence any deposition or part thereof, or any

other evidence, for any reason which would require the exclusion of the evidence according to the established rules of evidence, which will be applied strictly by the Office.

(l) Evidence not considered: Evidence not obtained and filed in compliance with these sections will not be considered

10. In § 2.124, paragraphs (a) and (b) are revised and a new paragraph (d) is added. As amended, § 2.124 reads as follows:

§ 2.124 *Testimony by depositions upon written questions.*

(a) A party may take the testimony of a witness by written questions to be propounded by an officer before whom depositions may be taken. See Rule 28 of the Federal Rules of Civil Procedure. The questions shall be served upon the other party within 10 days after the opening date set for taking the testimony of the party submitting the questions, together with a notice stating the name and address of the person who is to answer them and the name or descriptive title and address of the officer before whom the deposition is to be taken. Within 10 days thereafter, a party so served may serve cross questions upon the party proposing to take the deposition. Within 5 days thereafter, the latter may serve redirect questions upon a party who has served cross questions. Within 3 days after being served with redirect questions a party may serve recross questions upon the party proposing to take the depositions. Written objections to questions may be served on the party propounding the questions, and in response thereto substitute questions may be served, within 3 days.

(b) A copy of the notice and copies of all questions served shall be delivered by the party taking the testimony to the officer designated in the notice, who shall proceed to take the testimony of the witness in response to the questions and to prepare each answer immediately preceded by its corresponding question, then certify, and file the deposition, attaching thereto the copy of the notice and the questions received by him. Such depositions are subject to the same rulings for filing and serving copies as other depositions.

* * * * *

(d) Testimony in foreign countries shall be taken only by depositions upon written questions unless the parties stipulate otherwise in writing. Rule 28(b) of the Federal Rules of Civil Procedure shall apply to the taking of testimony in foreign countries.

§ 2.124a [*Revoked*]

11. Section 2.124a is revoked.

12. Section 2.125 is revised to read as follows:

§ 2.125 *Copies of testimony.*

(a) One copy of the transcript of testimony (taken in accordance with § 2.123(e) through (h) or § 2.124), together with copies of documentary exhibits, shall be served on each adverse party within 30 days after completion of the taking of such testimony. The certified transcript and exhibits and one copy of the transcript shall be filed in the Patent Office as promptly as possible.

(b) Each transcript and the copies thereof shall comply with § 2.123(g) as to arrangement, indexing and form.

13. In § 2.127, paragraphs (a) and (b) are revised. As amended, § 2.127 reads as follows:

§ 2.127 *Motions.*

(a) Motions shall be made in writing and shall contain a full statement of the grounds therefor. Any brief or memorandum in support of a motion shall accompany or be embodied in the motion. Briefs in opposition to a motion shall be filed within 15 days from the date of service of the motion unless another time is specified by the Trademark Trial and Appeal Board or the time is extended on request. Where a party fails to file a brief in opposition to a motion, the Trademark Trial and Appeal Board may treat the motion as conceded. Oral hearings will not be held on motions except on order of the Trademark Trial and Appeal Board.

(b) Any petition for reconsideration or modification of a decision, if it is not appealable, must be filed within 10 days after the decision or, if the decision is appealable, within the time specified in § 2.129(c). Any brief in opposition shall be filed within 15 days after service of the petition.

* * * * *

14. In § 2.128, paragraph (b) is revised. As amended, § 2.128 reads as follows:

§ 2.128 *Final hearings and briefs.*

(b) Briefs shall be submitted in typewritten or printed form, double spaced on letter or legal size paper. Without leave of the Trademark Trial and Appeal Board, no brief shall contain more than 50 pages of argument and, in case of the reply brief, the entire brief shall not exceed 25 pages. Each brief shall contain an alphabetical index of cases therein.

* * * * *

15. In § 2.129, paragraph (c) is revised. As amended, § 2.129 reads as follows:

§ 2.129 *Oral argument.*

* * * * *

(c) Any petition for rehearing, reconsideration, or modification of a decision must be filed within 30 days from the date thereof. Any brief in opposition shall be filed within 15 days after service of the petition.

Effective date. This revision shall be applicable to all proceedings instituted on or after July 1, 1972.

Date: April 5, 1972.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Approved: April 11, 1972.

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

[FR Doc. 72-5830; Filed 4-17-72; 8:52 am]

Published in 37 F.R. 7605; Apr. 18, 1972

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,103,137, I. Basgan, ROTARY WELL DRILLING APPARATUS; **3,507,341**, same, PROCESS AND SYSTEM FOR ROTARY DRILLING WITH DRILLING FLUID IMPOSED SONIC VIBRATIONS, **filed** Sept. 23, 1971, D.C., S.D.N.Y., Doc. 71-C-4199, *Ion Basgan* v. *Standard Oil Company of New Jersey et al.*

2,594,256, C. E. Compton, MINING MACHINE HEAD, **filed** Dec. 21, 1964, U.S. Ct. of App., 4th Cir., W. Va. (Fairmont), Doc. 803-F, *Charles E. Compton, Joy Manufacturing Company and Polan Industries, Inc.* v. *Metal Products, Inc.* The decision of the District Court sustaining the validity of the patent will be reversed, Nov. 15, 1971.

2,701,235, O. M. King. OPERATING SYSTEM FOR SWIMMING-POOL, **filed** Dec. 14, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-2933-LTL, *Oswald M. King* v. *A. J. Industries, Pacific Fabrication Co. and Wilmot M. Yeths.*

2,719,708. (See 2,784,955.)

2,760,255, C. E. Compton, SCREW CONVEYOR AND MANUFACTURE THEREOF, **filed** Nov. 2, 1970, U.S. Ct. of App., 4th Cir., W. Va. (Fairmont), Doc. 15,248, *Charles E. Compton, Joy Manufacturing Company and Polan Industries, Inc.* v. *Metal Products, Inc.* The decision of the District Court sustaining the validity of the patent will be reversed, decided Sept. 16, 1971.

2,784,955, C. E. Compton, ROTARY MINING MACHINE CUTTER HEAD WITH REAR HELICALLY EXTENDING TRANSVERSE OPENING; **2,719,708**, same, PAN GUIDEWAY FOR ROTARY MINING HEAD, **filed** May 17, 1971, D.C., N.D. W. Va. (Fairmont), Doc. C-71-11-F, *Republic Corporation and Advanced Mining Equipment & Services Co.* v. *Fair-Quip Corp., John Delli-Gatti and Harold F. Sargeant.*

2,807,213, S. Rosen, FILLING MACHINE; **2,907,614**, same, PRECISION PUMP; **3,237,661**, same, CONTAINER FILLING SYSTEM, **filed** Nov. 10, 1971, D.C.N.J. (Newark), Doc. C-1663-71, *Sidney Rosen and National Instrument Co., Inc.* v. *Harry G. Kalish, and H.G. Kalish Co., Ltd.*

2,907,614. (See 2,807,213.)

3,036,554, F. L. Johnson, PROTECTIVE DEVICES FOR DOGS, **filed** Nov. 16, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-2748-HP, *EVSCO Pharmaceutical Corp.* v. *North American Products Company.*

3,054,594, V. Hecht, CARBURETOR VALVE ASSEMBLY, **filed** Aug. 26, 1971, D.C. Kans. (Wichita), Doc. W-3222, *ACF Industries, Incorporated* v. *Victor Hecht and The Hecht Valve Company, Inc.* Injunction, defendants enjoined, Nov. 18, 1971.

3,089,301, S. J. Przekop, LAWN MOWER HANDLE SUPPORT, **filed** Nov. 17, 1971, D.C., E.D. Mich. (Detroit), Doc. 37428, *Fairway Construction Co.* v. *Allstate Modernization Inc.* **Same, filed** Sept. 10, 1971, D.C., E.D. Mich. (Detroit), Doc. 35342, *Fairway Construction Company* v. *City of Warren.* Consent decree of dismissal, Nov. 12, 1971. **Same, filed** Feb. 25, 1970, D.C., E.D. Mich. (Detroit), Doc. 34524, *Fairway Construction Company* v. *Woodfield Construction Co.* Judgment for permanent injunction, Nov. 22, 1971.

3,173,990, R. P. Lamons, FOAM-DIELECTRIC COAXIAL CABLE WITH TEMPERATURE INDEPENDENT RELATIVE CONDUCTOR LENGTH; **3,461,409,** R. F. Miller, GAS-SEALING ELECTRICAL FITTING FOR NON-CIRCULAR TUBULAR CONDUCTORS, **filed** Dec. 17, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c3021, *Andrew Corp.* v. *Justice Associates, Inc.*

3,216,513. (See 3,220,494.)

3,217,609. (See 3,342,111.)

3,220,494, Cannon, Winberg, McCurdy and Robbins, RAISE DRILLING METHOD AND MECHANISM; **3,454,114,** L. B. Poage, DRILLING MACHINE; **3,216,513,** Robbins and Winberg, CUTTER ASSEMBLIES FOR ROCK DRILLING; **3,463,247,** H. T. Klein, DRILL STEM BREAKOUT APPARATUS; **3,554,298,** same, BREAKOUT APPARATUS FOR A SECTIONAL DRILL STEM, **filed** Nov. 5, 1971, D.C., N.D. Tex. (Dallas), Doc. CA-3-5256-D, *The Robbins Company* v. *Dresser Industries, Inc.*

3,237,661. (See 2,807,213.)

3,321,081, A. H. Willinger, AQUARIUM FILTER APPARATUS; **3,392,836,** same, AQUARIUM WATER CONDITIONING APPARATUS, **filed** Dec. 13, 1971, D.C.N.J. (Newark), Doc. C-1857-71, *Metaframe Corporation* v. *Plast-O-Pak, Inc. and Alfred Weaver.*

3,342,111, R. H. Royster, FLUID PRESSURE ACTUATOR AND LOCKING MEANS; **3,217,609,** Same, **filed** Dec. 21, 1971, D.C. Md. (Baltimore), Doc. 71-1394-B, *Robert H. Royster* v. *United Airlines, Inc.*

3,392,836. (See 3,321,081.)

3,454,114. (See 3,220,494.)

3,461,409. (See 3,173,990.)

3,463,247. (See 3,220,494.)

3,474,553, G. E. Moore, FABRIC SPREADING AND FEEDING MACHINE, **filed** Nov. 6, 1969, D.C., S.D. Fla. (Miami), Doc. 69-1293-C-JLK, *A. L. Sjostrom Company* v. *Foldamatic Systems, Div. of First Research Corporation and John Dolan.* Dismissed for failure to comply with the court's pre-trial order, Nov. 17, 1971.

3,481,462, A. M. Chapel, DISPOSABLE SURGICAL HOLDER AND COUNTER, **filed** June 30, 1971, D.C., W.D. Mich. (Grand Rapids), Doc. 1408, *Yale Medical Supply Company et al.* v. *Windsor Nuclear, Inc. et al.*

3,496,635, McLean and Chatfield and Turner, REMOVABLE HAND LEVER AND WEAR COMPENSATING CAN OPENER CONSTRUCTION; **3,520,056,** R. J. Scott, REMOVABLE HAND LEVER CONSTRUCTION, **filed** Nov. 30, 1971, D.C., W.D. Mo. (Kansas City). Doc. 19903-4, *General Electric Company* v. *Rival Manufacturing Company.*

3,507,341. (See 2,103,137.)

3,520,056. (See 3,496,635.)

3,546,921. (See Re. 26,409.)

3,554,298. (See 3,220,494.)

3,585,456, L. Phillips, Jr., ELECTRIC SERVICE CENTER FOR MOBILE HOMES AND THE LIKE, **filed** Aug. 3, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-1802-R, *Unicorn Industries* v. *Las Palmas Estates Corp.* **Same, filed** Aug. 3, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-1806-IH, *Unicorn Industries* v. *Ralph Zora, doing business as Blue Fountain Park.* **Same, filed** Aug. 3, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-1809-R, *Unicorn Industries* v. *Benjamin and Genevieve Fleming.* **Same, filed** Aug. 3, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-1812-HP, *Unicorn Industries* v. *Myers Electric Products, Inc.* **Same, filed** Aug. 3, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-1814-R, *Unicorn Industries* v. *Joseph Cepe.* **Same, filed** Aug. 4, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-1820-IH, *Unicorn Industries* v. *Americana Land Corporation.* **Same, filed** Aug. 11, 1971, D.C. Idaho (Boise), Doc. C-1-71-71, *Unicorn Industries* v. *Idaho Power Company.* Notice of dismissal, Oct. 15, 1971. **Same, filed** Aug. 12, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-302-CW, *Unicorn Industries* v. *Henry J. Goldy & Associates.* Case dismissed voluntarily by plaintiff, Sept. 3, 1971. **Same, filed** Aug. 12, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-303-GT, *Unicorn Industries* v. *Trico Enterprises.* **Same, filed** Aug. 12, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-304-N, *Unicorn Industries* v. *Lee J. McClellan, doing business as Trailer Village.* Case voluntarily dismissed by plaintiff, Oct. 4, 1971. **Same, filed** Aug. 12, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-305-N, *Unicorn Industries* v. *Terry Hendsley, doing business as Rancho Vista Mobile Home Estates.* Case voluntarily dismissed by plaintiff, Oct. 14, 1971. **Same, filed** Aug. 12, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-306-CW, *Unicorn Industries* v. *Paul Pearson, Jr., doing business as Rancho Jamacha Mobile Home Park.* Case voluntarily dismissed by plaintiff, Oct. 14, 1971. **Same, filed** Aug. 12, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-307-T, *Unicorn Industries* v. *Maxine Fredericks and Coast Investment Properties.* Case voluntarily dismissed by plaintiff, Oct. 14, 1971. **Same, filed** Aug. 12, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-308-GT, *Unicorn Industries* v. *Agnes McDonald, doing business as Cypress Hills Mobile Home Park.* **Same, filed** Aug. 12, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-309-T, *Unicorn Industries* v. *Margaret J. Levins, doing business as Circle R. Mobile Rancho.* Case voluntarily disimssed by plaintiff, Sept. 8, 1971. **Same, filed** Aug. 12, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-310-GT, *Unicorn Industries* v. *Paul Heironimus, doing business as Care-Free Mobile Home Park.* Case voluntarily dismissed by plaintiff, Sept. 3, 1971. **Same, filed** Aug. 12, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-312-T, *Unicorn Industries* v. *Mobile Parks West.* Case voluntarily dismissed by plaintiff, Sept. 3, 1971. **Same, filed** Aug. 12, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-311-N, *Unicorn Industries* v. *Rodney W. Helland, doing business as Alta Vista Mobile Home Park.* Case voluntarily dismissed by plaintiff, Oct. 14, 1971. **Same, filed** Aug. 12, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-313-N, *Unicorn Industries* v. *Francis Cohen, Norman Tolstad, doing business as West Winds Mobile Lodge.* Case voluntarily dismissed by plaintiff, Sept. 3, 1971. **Same, filed** Sept, 3, 1971, D.C., N.D. Calif. (San Francisco), Doc. C-71-1711, *Unicorn Industries* v. *Gordon J. Olsen, doing business as Sunny Acres Mobile Home Park.* **Same, filed** Sept. 3, 1971, D.C., N.D. Calif. (San Francisco), Doc. C-71-1712, *Unicorn Industries* v. *Morris Haas, doing business as Windsor Mobile Country Club.* **Same, filed** Sept. 17, 1971, D.C., N.D. Calif. (San Francisco), Doc. 71-1804, *Unicorn Industries* v. *Paul Sade, doing business as The Tropics Mobile Home Park.* **Same, filed** Sept. 30, 1971, D.C., N.D. Calif. (San Francisco), Doc. C-71-1892, *Unicorn Industries* v. *Mobile Parks West.* **Same, filed** Sept. 30, 1971, D.C., N.D. Calif. (San Francisco), Doc. C-71-1893, *Unicorn Industries* v. *Harold Pike, doing business as Lemon Tree Mobile Home Park.* **Same, filed** Sept. 30, 1971, D.C., N.D. Calif. (San Francisco), Doc. 71-1894, *Unicorn Industries* v. *Hofman Co.* **Same, filed** Oct. 4, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-381-CW, *Unicorn Industries* v. *Henry J. Goldy & Associates.* Case dismissed by plaintiff, Nov. 10, 1971. **Same, filed** Oct. 4, 1971, D.C., S.D. Calif. (San Diego), Doc. 71-382-T, *Unicorn Industries* v. *Francis Cohen and Norman Tolstad, doing business as West Winds Mobile Lodge.*

Re. 25,614, L. A. Turzillo, MEANS OF GROUTING AND CONCRETING, **filed** Dec. 16, 1971, D.C., E.D. Pa. (Philadelphia), Doc. 71-3013, *Lee Turzillo Contracting Co., Inc.* v. *Eastern Gunite Company.*

Re. 26,409, R. J. Hance, EXPANDABLE PHASE CHANGE DETECTOR DEVICE; **3,546,921,** Bourke, Harris and Muff, METHOD OF PRODUCING AN INITIAL THERMAL ARREST IN THE COOLING CURVE OF HYPEREUTECTIC CAST IRON, **filed** Dec. 23, 1971, D.C., E.D. Pa. (Philadelphia), Doc. 71-3056, *Leeds & Northrup Company and Foundry Engineers, Inc.* v. *Electro-Nite Co.*

Re. 27,111, R. E. Wilson, PITCH-BONDED REFRACTORY COMPOSITION, **filed** Dec. 3, 1971, D.C., W.D. Pa. (Pittsburgh), Doc. 71-1136, *Dresser Industries, Incorporated* v. *Basic, Incorporated.*

D. 221,713, P. Kates, UMBRELLA, filed Nov. 24, 1971, D.C., S.D.N.Y., Doc. 71–C–5146, *Giant Umbrella Company, Inc.* v. *Associated Dry Goods Corp.* Same, filed Nov. 24, 1971, D.C., S.D.N.Y., Doc. 71–C–5147, *Giant Umbrella Company, Inc.* v. *R. H. Macy & Company, Inc.* Same, filed Nov. 24, 1971, D.C., S.D.N.Y., Doc. 71–C–5148, *Giant Umbrella Company, Inc.* v. *Lane Bryant, Inc.* Same, filed Nov. 24, 1971, D.C., S.D.N.Y., Doc. 71–C–5149, *Giant Umbrella Company, Inc.* v. *Bergdorf & Goodman Company, Inc.* Same, filed Nov. 24, 1971, D.C., S.D.N.Y., Doc. 71–C–5150, *Giant Umbrella Company, Inc.* v. *B. Altman & Company, Inc.*

Certificates of Correction for the Week of May 16, 1972

P.P. 3,024	3,565,928	3,586,704	3,598,250	3,611,271	3,616,158	3,619,444	3,624,243
D. 220,281	3,565,936	3,587,347	3,598,351	3,611,301	3,616,209	3,619,550	3,624,278
D. 221,587	3,567,511	3,587,381	3,599,406	3,611,351	3,616,282	3,619,694	3,624,821
Re. 27,152	3,569,701	3,587,796	3,599,820	3,612,011	3,616,309	3,619,803	3,624,989
Re. 27,252	3,574,189	3,588,196	3,600,216	3,612,534	3,616,310	3,619,808	3,625,203
3,404,864	3,575,000	3,588,441	3,601,266	3,612,607	3,616,314	3,621,917	3,625,881
3,431,275	3,575,076	3,588,732	3,601,564	3,612,948	3,616,362	3,622,041	3,625,887
3,475,364	3,577,102	3,589,489	3,602,556	3,613,007	3,616,782	3,622,346	3,626,059
3,486,560	3,578,278	3,589,793	3,603,205	3,613,296	3,616,855	3,622,359	3,626,279
3,493,359	3,578,337	3,590,744	3,603,416	3,613,663	3,616,953	3,622,360	3,626,657
3,503,731	3,578,457	3,590,760	3,604,804	3,613,853	3,616,954	3,622,401	3,626,682
3,509,188	3,579,166	3,590,853	3,606,284	3,614,167	3,616,979	3,622,404	3,626,879
3,522,195	3,579,307	3,590,982	3,607,082	3,614,378	3,617,402	3,622,440	3,627,297
3,522,232	3,579,974	3,591,210	3,607,288	3,614,383	3,617,420	3,622,471	3,627,807
3,530,211	3,580,366	3,592,396	3,607,348	3,614,397	3,617,494	3,622,492	3,628,429
3,534,843	3,581,014	3,592,623	3,607,700	3,614,447	3,617,616	3,622,533	3,628,977
3,543,098	3,581,091	3,593,852	3,607,875	3,614,472	3,617,621	3,622,564	3,630,554
3,544,865	3,581,553	3,594,175	3,608,063	3,614,706	3,617,866	3,622,583	3,630,584
3,545,129	3,582,186	3,594,652	3,608,529	3,614,737	3,617,868	3,622,643	3,630,890
3,545,748	3,582,314	3,594,706	3,608,764	3,615,120	3,618,035	3,622,645	3,631,359
3,551,108	3,582,398	3,595,123	3,609,341	3,615,168	3,618,083	3,622,805	3,631,762
3,553,246	3,582,895	3,595,794	3,609,373	3,615,293	3,618,449	3,622,825	3,631,867
3,553,374	3,583,146	3,596,776	3,609,380	3,615,352	3,618,638	3,622,856	3,632,118
3,553,845	3,583,634	3,596,786	3,609,404	3,615,427	3,618,724	3,622,866	3,633,309
3,554,562	3,584,027	3,597,201	3,609,497	3,615,475	3,618,748	3,623,024	3,633,856
3,556,419	3,584,185	3,597,378	3,610,388	3,615,520	3,618,774	3,623,155	3,635,618
3,558,540	3,585,218	3,597,463	3,610,495	3,615,668	3,619,058	3,623,498	3,636,233
3,558,620	3,585,613	3,597,485	3,610,805	3,615,705	3,619,222	3,623,980	
3,560,343	3,585,701	3,597,790	3,610,919	3,615,769	3,619,243	3,623,984	
3,560,489	3,585,886	3,598,755	3,610,971	3,615,816	3,619,261	3,624,133	
3,560,784	3,585,888	3,598,110	3,611,001	3,615,834	3,619,381	3,624,150	
3,561,751	3,586,000	3,598,170	3,611,180	3,615,972	3,619,420	3,624,182	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 2, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-01-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-04-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	3-01-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director... Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	3-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director.. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-06-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	9-07-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-11-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-04-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-15-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	2-26-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	1-18-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	3-11-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	2-02-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-03-71
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	4-21-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	3-15-71

Expiration of patents: The patents within the range of numbers indicated below expire during May 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,707,277 to 2,709,807, inclusive
Plant Patents..... Numbers 1,389 to 1,395, inclusive

REISSUES

MAY 16, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

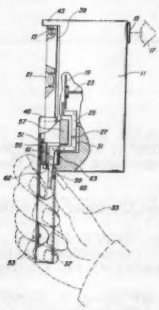
27,362
CAMERA WITH RETRACTABLE HAND GRIP

Richard J. Olson, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,380,366, dated Apr. 30, 1968, Ser. No. 484,640, Sept. 2, 1965. Application for reissue Mar. 4, 1969, Ser. No. 827,435

Int. Cl. G03b *17/04*

U.S. Cl. 95—86 17 Claims



An improved handle member for a camera having an optical system and a trigger element. The handle member is mounted on the camera for movement between a first position, wherein said member covers the optical system and trigger element and a second position wherein said member uncovers the optical system and trigger element and provides a handle for supporting the camera while taking pictures.

27,363
INTERMEDIATE FREQUENCY TRANSFORMER

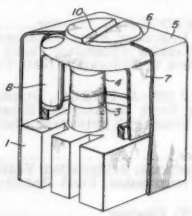
Kazutomo Iwata and Tatsuo Maeoka, Osaka, Japan, by Matsushita Electric Industrial Co. Ltd., assignee

Original No. 3,521,210, dated July 21, 1970, Ser. No. 728,558, May 13, 1968. Application for reissue Jan. 28, 1971, Ser. No. 110,729

Claims priority, application Japan, May 25, 1967, 42/33,547; June 2, 1967, 42/47,394; June 6, 1967, 42/48,877; Jan. 18, 1968, 43/3,484; Jan. 26, 1968, 43/5,097

Int. Cl. H01f *21/06*

U.S. Cl. 336—87 6 Claims



Intermediate frequency transformers wherein a core having a coil wound thereon is fixed to a terminal board, a movable core associated with said core is provided in the outer peripheral portion of a support member having an adjusting portion exposed from the top surface of a shield casing, said movable core is adapted for two-dimensional movement, said support member is mounted in such a manner that the axis of rotation thereof is deviated from the center axis of said coil, and the distance between the movable core and the coil is changed through the rotation of the support member so that the inductance of the coil is varied accordingly.

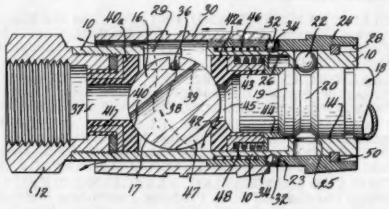
27,364
VALVED [SAFETY] SPEED COUPLER

Dale F. German, Bryan, Ohio, assignor to The Aro Corporation

Original No. 3,423,063, dated Jan. 21, 1969, Ser. No. 587,768, Oct. 19, 1966. Application for reissue July 24, 1970, Ser. No. 58,211

Int. Cl. F16l *29/00, 37/28*

U.S. Cl. 251—149.6 12 Claims



A valved speed coupler includes a rotatable valve element and an arrangement of first radially movable locking elements operable by a first sleeve slidable on the body of the coupler, a second sleeve being also slidable on the body of the coupler and operable to rotate the valve element on an axis normal to the axis of movement of the second sleeve to open and close the valve element, and means for coaction of the sleeves to actuate the locking elements when the sleeves are in a valve open position and release them when the sleeves are in a valve closed position.

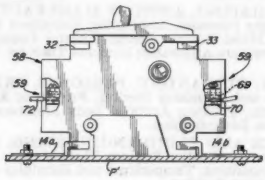
27,365
MOLDED CASE CIRCUIT BREAKER AND MOUNTING MEANS THEREFOR

Edward P. Dessert, Cedar Rapids, Iowa, assignor to Square D Company, Park Ridge, Ill.

Original No. 3,398,249, dated Aug. 20, 1968, Ser. No. 615,435, Feb. 13, 1967. Application for reissue Feb. 26, 1970, Ser. No. 14,412

Int. Cl. H01h *9/02*

U.S. Cl. 200—168 C 1 Claim



A pair of mounting brackets are removably secured selectively at either the top or bottom of a molded case circuit breaker. When the brackets are at the bottom, the circuit breaker may be mounted with its bottom surface against the outer surface of a panel. When the brackets are at the top, the circuit breaker may be mounted against the inner surface of a panel with an upper portion protruding through an opening in the panel. Screw-type wire connectors at opposite ends of

the circuit breaker are reversible so that the wire-clamping screws can be made accessible to a conventional screwdriver irrespective of the mounted position of the circuit breaker.

27,366
PROCESS OF MAKING SOLID FOAMS FROM POLYMER EMULSIONS

Edwin R. Dunn, Fremont, Ohio, assignor to Crown Rubber Company, Fremont, Ohio

No Drawing. Original No. 3,491,033, dated Jan. 20, 1970, Ser. No. 707,965, Feb. 26, 1968, which is a continuation-in-part of Ser. No. 447,890, Apr. 13, 1965. Application for reissue July 13, 1970, Ser. No. 54,671

Int. Cl. C08j *1/16*

U.S. Cl. 260—2.5 L **8 Claims**

A process of making a solid foam which is applicable to any polymer that is available in the form of an aqueous emulsion and is film forming at a temperature below 300° F., in which an aqueous dispersion of the polymer is converted into a wet foam, and the wet foam is then converted into a solid foam. The process is carried out by incorporating in the aqueous dispersion which is converted to a wet foam, a foaming agent that is incapable of gelling the wet foam, the aqueous dispersion being free of other agents capable of gelling the wet foam and containing not more than 45 weight percent of volatiles, and then subjecting the wet foam to a drying operation *by heating it* without gelling the wet foam, the amount of foaming agent present being sufficient to maintain a foam structure during the drying operation until a solid cellular material is obtained. [Finally] *As the volatiles evaporate during the drying operation,* the solid cellular material is heated to *a temperature that is at least as high as* the film-forming temperature of the polymer to cure *or fuse* the polymer.

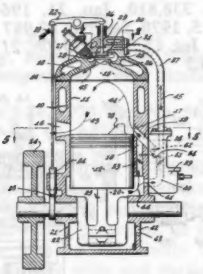
27,367
FULL PRESSURE CYCLE ENGINE WITH EXCESS AIR

Ernest A. von Seggern, 1051 E. Angeleno, Burbank, Calif. 91501, and Henry E. von Seggern, Rte. 2, Escondido, Calif. 92025

Original No. 3,363,611, dated Jan. 16, 1968, Ser. No. 451,720, Apr. 29, 1965. Application for reissue Jan. 9, 1970, Ser. No. 885,747

Int. Cl. F02b *1/08, 33/04, 39/04*

U.S. Cl. 123—65 **8 Claims**



1. In [a two cycle] *an* internal combustion engine, of the spark ignition type, the combination of:

a combustion chamber in communication with said cylinder;

an ignition chamber substantially in the form of a spheroid, which is a figure of revolution about its minor axis;

a passage substantially coaxial with the minor axis of said spheroid joining said ignition chamber to said combustion chamber;

fuel air mixture supply means for said ignition chamber;

separate fuel air mixture supply means for said combustion chamber; and

spark ignition means in said ignition chamber *in which the point of ignition of said ignition means in said ignition chamber is located substantially on the circular axis of the toroidal cavity formed by the spheroidal ignition chamber.*

27,368
TROUSERS PRESS

Peter John Siddons Corby, Windsor, England, assignor to Rondel Limited, Hamilton, Bermuda

Original No. 3,477,154, dated Nov. 11, 1969, Ser. No. 768,450, Oct. 17, 1968. Application for reissue Feb. 19, 1971, Ser. No. 117,169

Int. Cl. A47j *51/00*

U.S. Cl. 38—71 **5 Claims**

A trousers press has two flat members between which trousers are pressed. Each of two stretcher bars is movably mounted on a respective one of the two flat members, for gripping the upper part of the trousers between the stretcher bars during closing of the press and while the press is closed.

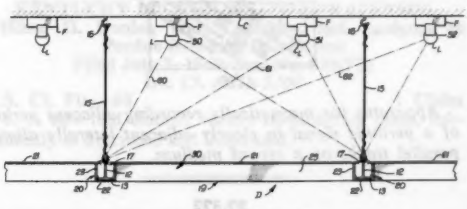
27,369
CEILING LIGHT DIFFUSER SYSTEM

Leonard F. Milner, Los Angeles, Calif., assignor to Integrated Ceilings Inc., Los Angeles, Calif.

Original No. 3,336,471, dated Aug. 15, 1967, Ser. No. 447,121, Apr. 12, 1965. Application for reissue Oct. 20, 1969, Ser. No. 869,975

Int. Cl. F21s

U.S. Cl. 240—9 R **15 Claims**



A light diffuser system suspended from a ceiling below a light source and having a framework of inverted T-bars defining rectangular openings, channel-shaped members or a frame structure supporting light diffusers across the openings such that the diffusers lie in a plane contiguous the plane of the upper ends of the vertical T-bar flanges to substantially entirely eliminate T-bar shadow cast by the light source on the diffusers.

27,370
AUTOMATIC SHAPE CONTROL SYSTEM FOR BAR MILL

John R. McNaugher, 39 Birchwood Drive, Holden, Mass. 01520

Original No. 3,526,113, dated Sept. 1, 1970, Ser. No. 720,892, Apr. 12, 1968. Application for reissue Nov. 16, 1970, Ser. No. 90,165
Int. Cl. B21b 37/00
U.S. Cl. 72—8 19 Claims

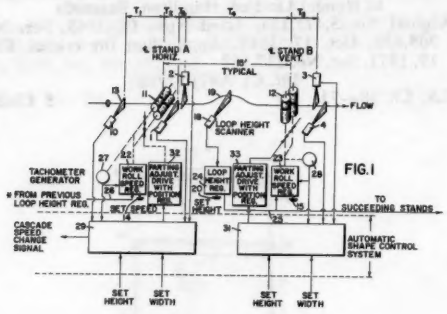


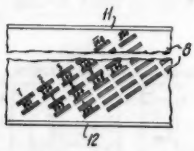
FIG. 1

A rolling mill for rods, bars and various shaped cross-sections has finishing stands with roll axes oriented ninety degrees (90°) relative to adjacent stands and automatic control of the rolling parameters to obtain precise transverse dimensions. Two transverse dimensions and the loop size between stands are sensed and use to control stand speed and roll separation in a feedback control loop while variables relating to stand loading and product characteristics are used to make supplementary or compensating adjustment. Further control signals are derived relating to mass flow to provide compatible adjustment of rolling parameters throughout the mill.

27,371
RECORDING SYSTEM WITH PROVISION FOR FAST OR SLOW REPRODUCTION

Shiro Okamura, Tokyo, Japan, by Nippon Electric Company, Limited, Tokyo, Japan, assignee

Original No. 3,170,031, dated Feb. 16, 1965, Ser. No. 338,277, Dec. 27, 1963, which is a continuation of Ser. No. 66,770, Nov. 2, 1960. Application for reissue Mar. 22, 1971, Ser. No. 126,569
Int. Cl. G11b 5/48; H04n 5/78, 7/12
U.S. Cl. 178—6.6 A 17 Claims



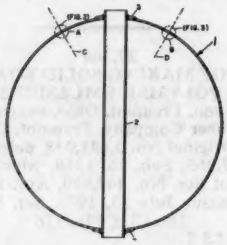
Apparatus for magnetically recording adjacent periods of a periodic signal in closely adjacent laterally aligned parallel tracks on a record medium.

27,372
BUOYANT DEVICE

Charles Garland, Newport News, Va., assignor to Sun Shipbuilding & Dry Dock Company, Chester, Pa.

Original No. 3,407,417, dated Oct. 29, 1968, Ser. No. 563,193, July 6, 1966. Application for reissue Dec. 18, 1969, Ser. No. 888,177
Int. Cl. B63b 21/52
U.S. Cl. 9—8 R 3 Claims

A buoyant hollow sphere, designed for deep submergence, is internally pressurized with inert gas to enable reduction in its wall thickness and, hence, its weight. A diametrically-extending sleeve is welded through the wall

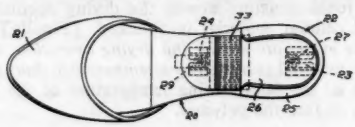


of the sphere, to enable the sphere to be slid over a pipe which is to be buoyed up.

27,373
FOOTWEAR

Maxwell Sachs, 887 W. Roxbury Parkway, Brookline, Mass. 02162

Original No. 3,436,846, dated Apr. 8, 1969, Ser. No. 758,179, Aug. 12, 1968, which is a continuation-in-part of Ser. No. 600,872, Dec. 12, 1966. Application for reissue Apr. 2, 1970, Ser. No. 25,595
Int. Cl. A43b 00/00
U.S. Cl. 36—2.5 W 36 Claims

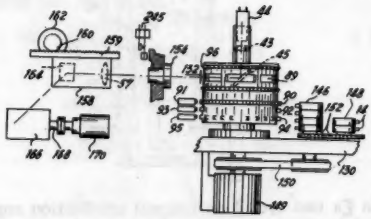


Footwear is disclosed that has a socket in the heel area and a heel section detachably attached to the socket and including an upper part.

27,374
TYPE COMPOSING APPARATUS

Louis M. Moyroud, Delray Beach, Fla., and Rene A. Higonnet, Vaud, Switzerland (both % Photon, Inc., 355 Middlesex Ave., Wilmington, Mass. 01887)

Original No. 3,422,736, dated Jan. 21, 1969, Ser. No. 441,738, Mar. 22, 1965, which is a continuation-in-part of Ser. No. 338,810, Jan. 21, 1964. Application for reissue June 5, 1970, Ser. No. 43,987
Int. Cl. B41b 19/06, 21/26
U.S. Cl. 95—4.5 20 Claims



This invention relates to a phototypesetter which is used in the graphic arts to produce on photographic film or paper areas of typographic composition. The apparatus described herein comprises a constantly rotating character carrying drum wherein characters are selectively illuminated by a high speed flash tube, an optical projection system a portion of which is adapted for periodic translation in relation to the film and an electronic control circuit which accepts input data, performs a justification calculation and controls the character selection and projection apparatus.

PLANT PATENTS

GRANTED MAY 16, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,168
HOLLY BUSH

Rowell B. Taylor, Jr., Greer, S.C., assignor to Monrovia Nursery Company, Azusa, Calif.
Filed Mar. 20, 1970, Ser. No. 21,556
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—65 **1 Claim**

1. A new and distinct variety of *Ilex cornuta* plant substantially as shown and described, characterized by its dwarf size, its slow growth habit, its arching spreading branches with the absence of any central leader or trunk forming a tightly compact bush.

3,169
CRAPE MYRTLE

Otto F. Spring, Okmulgee, Okla., assignor to Monrovia Nursery Company, Azusa, Calif.
Filed May 20, 1970, Ser. No. 39,184
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—54 **1 Claim**

A new and distinct variety of the Lagerstroemia genus characterized as to novelty by its compact, upright habit of growth and by flower clusters recognizably different from other Lagerstroemia, particularly by the red petals with white borders creating a picotee effect.

3,170
CAMELLIA HYBRID

J Howard Asper, Escondido, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.
Filed June 5, 1970, Ser. No. 43,986
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—62 **1 Claim**

A new and distinct variety of camellia, originating as a seedling from a crossing of *Camellia reticulata* "Crimson Robe" (the seed parent) and *Camellia japonica* "Lotus" (the pollen parent). The new camellia is characterized as to novelty by its exceptionally large flower and its large coriaceous leaves.

3,171
AZALEA PLANT

Walter W. Knicely, Barberton, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio
Filed July 20, 1970, Ser. No. 56,759
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—56 **1 Claim**

1. A new and distinct variety of azalea characterized particularly as to novelty by its rapid growth and good size increase, its uniform and easy budding, its earliness in natural season flowering programs, its rose-pink color, its long-lastingness and its adaptibility to year round flowering programs under wide and varied conditions.

3,172
AZALEA PLANT

Henry W. Motzkau, Whitewater, Wis., assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed July 20, 1970, Ser. No. 56,760
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—56 **1 Claim**

1. A new and distinct variety of azalea characterized particularly as to novelty by its evergreen type foliage, its rapid growth, its ease of budding under variable conditions, its lavender pink color, its long-lastingness, its early profuse flowering, and its adaptability to year round flowering programs.

3,173
GERANIUM PLANT

Walter W. Knicely, Barberton, and William E. Duffett, Akron, Ohio, assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed Aug. 26, 1970, Ser. No. 67,300
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of geranium, characterized particularly by its early response and superior flower production in 4" pots in a spring pot program, superior flower production in an outdoor flowering program, a clear white color with no tendencies towards heavy watering conditions, and superior durability to outdoor conditions.

3,174
GERANIUM PLANT

Walter W. Knicely, Barberton, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio
Filed Aug. 26, 1970, Ser. No. 67,301
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of geranium characterized particularly by an early response and superior flower production in 4" spring pot program, resistance to shatter, durable foliage and flowers to outdoor conditions, resistance to botrytis, and a Cherry Blossom-pink color with attractive white eye.

3,175
KENTUCKY BLUEGRASS (*POA PRATENSIS*)

William H. Daniel, West Lafayette, Ind., assignor to Purdue Research Foundation
Filed July 7, 1969, Ser. No. 839,731
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of bluegrass plant, substantially as described and illustrated.

3,176
KENTUCKY BLUEGRASS (*POA PRATENSIS*)

William H. Daniel, West Lafayette, Ind., assignor to Purdue Research Foundation
Filed July 7, 1969, Ser. No. 839,733
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of bluegrass plant, substantially as described and illustrated.

3,177
KENTUCKY BLUEGRASS (*POA PRATENSIS*)

William H. Daniel, West Lafayette, Ind., assignor to Purdue Research Foundation
Filed July 7, 1969, Ser. No. 839,734
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of bluegrass plant, substantially as described and illustrated and particularly

characterized by excellent stem rust resistance, in addition to low and slow growth habit and dark green color.

3,178
STRAWBERRY PLANT
Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, Calif., assignors to The Regents of the University of California, Berkeley, Calif.
Filed July 25, 1969, Ser. No. 845,103
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—48 **1 Claim**

1. A new and distinct strawberry variety described and illustrated, and characterized particularly by its low chilling requirement, ability to grow at relatively low temperature and great flexibility under the winter planting system; its exceptionally large fruit size of long conic shape, excellent dessert quality and high productivity under the winter planting system in coastal California.

3,179
PEACH TREE
Ronald Paul, 5485 E. Heaton Ave., Fresno, Calif. 93727
Filed Nov. 12, 1969, Ser. No. 876,148
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach substantially as illustrated and described, which is characterized by its early maturity, approximately two weeks earlier than the unpatented Redhaven and by fruit having the same general characteristics as the Redhaven but deep yellow skin color along the suture a more pronounced cling stone and a more pronounced mucronate apex.

3,180
EA 673—ST. AUGUSTINEGRASS
Jake T. Gruis, Apopka, Fla., and Eugene W. Mayer and John A. Long, Marysville, Ohio, assignors to O. M. Scott & Sons Company, Marysville, Ohio
Filed Dec. 2, 1969, Ser. No. 881,640
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 **1 Claim**

A perennial hybrid St. Augustinegrass having a moderate olive green color, very good gray leafspot resistance and excellent resistance to insects including sod webworms and chinchbugs. This hybrid possesses vigorous growth and is easily propagated.

3,181
DISTINCT VARIETY OF MANGO
David Sturrock, 1020 Camellia Road, West Palm Beach, Fla. 33480
Filed Dec. 18, 1969, Ser. No. 886,431
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—33 **1 Claim**

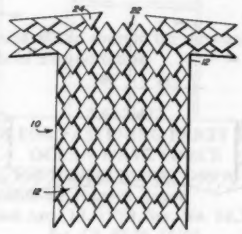
1. The variety of mango as described and shown herein.

PATENTS

GRANTED MAY 16, 1972

GENERAL AND MECHANICAL

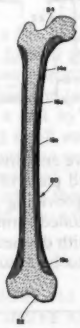
3,662,404
CLOTHING CONSTRUCTION
Bettie Jane Schinker, 1632 East Cedar Street, Tempe, Ariz.
Filed June 22, 1970, Ser. No. 47,979
Int. Cl. A41d *1/04*
U.S. Cl. 2—243 R **9 Claims**



A hemless and seamless garment constructed from a plurality of interconnected components of material to enable various garments to be constructed by obtaining precut components or cutting such components from garment material or the like and connecting them together in a manner to form various garments.

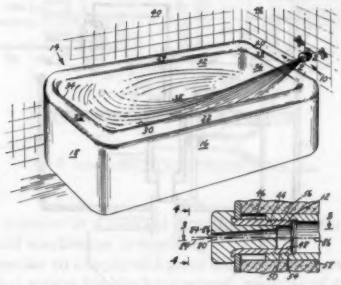
The present invention generally relates to the construction of articles of clothing and more particularly the arrangement of component parts in a particular manner to form garments which are hemless and seamless and yet are quite attractive in appearance, fashionable and utilitarian.

3,662,405
REINFORCED POROUS CERAMIC BONE PROSTHESIS
Seymour A. Bortz, Highland Park; Harold L. Rechter, Chicago; William E. Reynolds, Western Springs, and Seymour Bazell, Chicago, all of Ill., assignors to IIT Research Institute, Chicago, Ill.
Filed Mar. 12, 1969, Ser. No. 806,578
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **3 Claims**



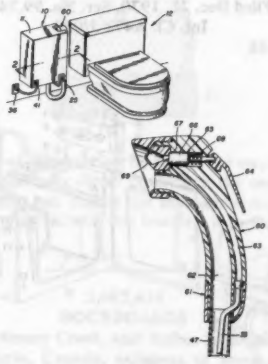
A structural member having a core of porous material permitting fluid flow and an outer layer of composite material having rigid matrix with reinforcing material embedded therein. The member finds its primary use in prosthetics.

3,662,406
ADJUSTABLE FLUID INLET SPOUT
Gino Giglio, 105 West 13th Street, New York, N.Y.
Filed June 15, 1970, Ser. No. 46,184
Int. Cl. A47k *17/00, 3/00*
U.S. Cl. 4—1 **5 Claims**



An adjustable fluid inlet spout for introducing fluids into a receptacle, such as a tub, sink, or tank. The spout contains a through passage which is angularly disposed to the central axis of the spout. The spout is adjustable, allowing the fluid moving through the passage to be directed as desired, in a generally horizontal direction, making contact with the sides of the receptacle. The spout may be placed eccentrically of the central longitudinal axis of the tub.

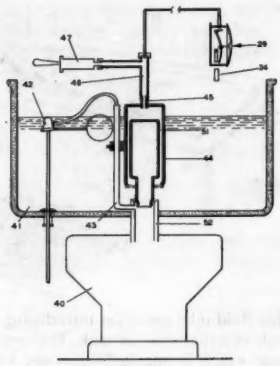
3,662,407
PERSONAL HYGIENE DEVICE
Donald E. Colucci, 2335 Aurora Street, Hudson, Ohio
Filed May 25, 1970, Ser. No. 40,321
Int. Cl. A47k *3/22, 11/08*
U.S. Cl. 4—7 **8 Claims**



A personal hygiene device has a housing to which a length of flexible air hose is attached. The housing has a switch controlled wiring system connected to an electrical supply and a valve controlled conduit system connected to a water supply. An electric heating element and fan in the housing when ac-

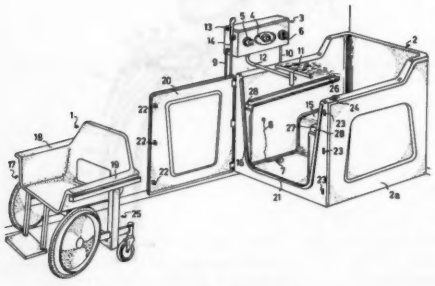
tivated by the switch supplies warm filtered air to the air hose whereas a housing valve controls the passage of water to a flexible line. The flexible line and the air hose both are connected to a manually operated applicator which selectively discharges water and air for the purpose of personal hygiene.

3,662,408
VALVE OPERATOR EMBODYING TIME-DELAYED CLOSING MEANS
Vernon E. Knudtson, 5318 Camden Road, Madison, Wis.
Filed Sept. 16, 1970, Ser. No. 73,044
Int. Cl. E03d *1/34, 5/02*
U.S. Cl. 4—67 **7 Claims**



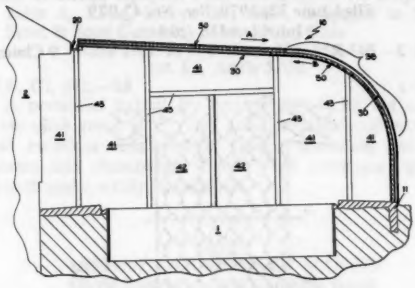
A flush tank valve operator comprising an open-bottomed vessel buoyantly responsive to differential pressure of fluid media caused by the water level rising in the flush tank and provided with valve means for releasing super-atmospheric air within said vessel to atmosphere directly or through delayed response means comprising a resiliently expandable chamber provided with a bleed port.

3,662,409
BATH SYSTEM, PARTICULARLY FOR WHEEL-CHAIR CONSTRAINED DISABLED PERSONS
Hans Arne Johansson, Treharadsvagen 40, Eslov, Sweden
Filed Dec. 21, 1970, Ser. No. 99,743
Int. Cl. A47k *3/022*
U.S. Cl. 4—145 **10 Claims**



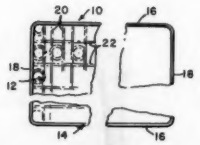
A bath system is provided for domestic bathrooms especially designed for wheel-chair constrained disabled persons whereby the wheel-chair seat can be moved into a sit-down type bath tube and removed thereby by controls on a tub-side panel. Means are provided for filling and emptying the tub and generally for enabling a disabled person to bathe without aid.

3,662,410
ENCLOSURES FOR POOLS AND THE LIKE
Jay A. Lankheet, Holland, Mich., assignor to Glamour Pools Company, Holland, Mich.
Filed Sept. 22, 1970, Ser. No. 74,400
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.12 **20 Claims**



A plurality of support members for the pool enclosure extend upwardly from a foundation and then curve out over the pool and are fastened at their opposite ends to a steel gutter which in turn is secured to the eave of a house. Each support member, except the end two, includes a pair of tracks on either side such that a flexible, insulated panel can be slidably supported between a pair of adjacent support members in one of said tracks, while a second flexible, insulated panel can be supported between adjacent support members and the second track. Each end support member includes a pair of tracks only on one side, pointing inwardly.

3,662,411
SPRING ASSEMBLY
Harry A. Garceau, Charlton City, Mass., assignor to Webster Spring Co., Inc., Oxford, Mass.
Filed Dec. 14, 1970, Ser. No. 97,733
Int. Cl. A47c *23/02, 23/04*
U.S. Cl. 5—266 **13 Claims**

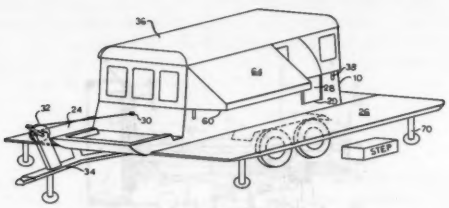


A coiled spring structure comprising a wire frame to which there are attached spaced pairs of longitudinally and transversely extending wires providing at their intersections end supports for the ends of coiled springs and coiled springs having end loops provided with diametrically disposed, reversely bent segments adapted to be sprung into engagement with the wires at the seats.

3,662,412
HULL DESIGN USEFUL WITH HOUSEBOATS
Robert D. Hawkins, 115 Stony Hollow Rd., Greenlawn, N.Y.
Filed Jan. 5, 9170, Ser. No. 523
Int. Cl. B63b *35/00*
U.S. Cl. 9—1 R **7 Claims**

A hull design, especially useful for houseboats, has hinged side decks. The hull combines with a trailer to provide a land

camping vehicle; and a lowerable roof for such hull, together with the hinged side decks, cooperates to enclose the hull for



protection thereof and to shorten the dimensions of the vehicle for purposes of transportation.

3,662,413

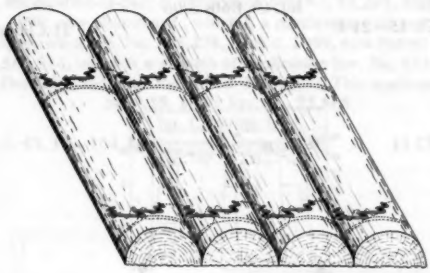
METAL RING FOR FASTENING PARTS BY MEANS OF OCEAN WAVE FORCE

Toshiro Andoh, and Hachiro Andoh, both of No. 1-2 chome, Inori-cho, Minoto-ku, Nagoya, Japan

Filed Apr. 13, 1970, Ser. No. 10,354

Int. Cl. B63b *35/00*

U.S. Cl. 9—16 **2 Claims**



A wire holder made of a flexible metallic bar and having a center loop, an end loop formed at each end thereof and a substantially straight or arm portion extending between said center loop and each of said end loops, and a method of assembling loose logs into a raft by using said wire holders. When the logs constituting a raft assembled according to the present invention are exposed to ocean waves and the wires fastening those logs are stretched, the wire holders according to the present invention adapt themselves to the wires engaged therewith and hold the wires and the logs firmly together.

3,662,414

THREADER DRIVE APPARATUS

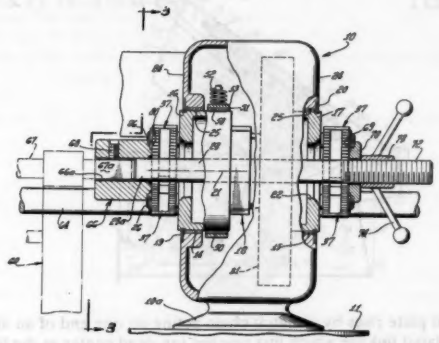
Howard N. Behnke, San Gabriel, Calif., assignor to Collins Machinery Corporation, Monterey Park, Calif.

Filed Aug. 11, 1970, Ser. No. 62,807

Int. Cl. B23g *1/44, 1/52*

U.S. Cl. 10—89 **8 Claims**

Coupler mechanism including a drive shaft adapted for coupling a drive apparatus with a driven apparatus, the drive apparatus including actuator means rotatable in opposite directions and a series of jaws carried to be pivoted into engagement with the coupler drive shaft and to rotate the shaft forwardly in response to actuator means rotation in a forward rotation, the driven apparatus including an input member rotatable in opposite directions and structure responsive to



member rotation in a forward direction to effect threading of a pipe, said mechanism comprising

a. a connector to couple said drive shaft to said member, and

b. retention means for blocking reverse pivoting of the jaws out of engagement with the drive shaft in response to actuator means rotation in a reverse direction.

3,662,415

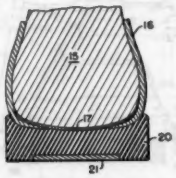
METHOD OF MAKING FOOTWEAR HAVING INSOLE AND INTERMEDIATE SOLE OF THREE-DIMENSIONAL SHAPE

Ernest E. Doane, 129 Highfield Rd., Abington, Mass.

Continuation of application Ser. No. 822,826, Apr. 8, 1969, now abandoned , which is a continuation-in-part of application Ser. No. 478,923, Aug. 11, 1965, now abandoned. This application June 12, 1970, Ser. No. 48,858

Int. Cl. A43d *21/00*

U.S. Cl. 12—145 **2 Claims**



The process of shoemaking by which the steps of molding a flat mulled insole by direct contact to the contoured bottom of a wooden last and at the same time completing the shoe by forming an outsole and bonding it to the molded insole.

3,662,416

DOCKBOARDS

David Brooks, Stoney Creek, and Arthur L. Reteff, Hamilton, both of Ontario, Canada, assignors to Serco Engineering Limited, Hamilton, Ontario, Canada

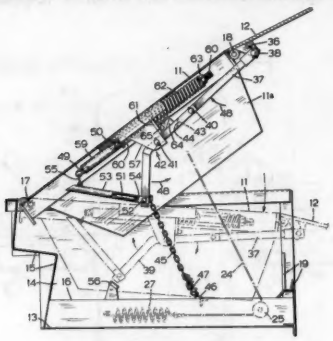
Filed Dec. 29, 1970, Ser. No. 102,442

Int. Cl. B65g *11/00*

U.S. Cl. 14—71 **8 Claims**

A dockboard comprises a main plate hinged at its rear edge to a frame and having a lip plate hinged at its front edge. Upwardly acting springs beneath the main plate are sufficiently strong to move the board upwards in the absence

of a weight thereon. A cable is connected between the frame and the board, one end of the cable being wound around a ratchet-controlled reel which holds the board in any position to which it is set; a manually controlled release is provided for the ratchet. The lip plate is automatically elevated as the



main plate rises by a snatch chain acting on one end of an articulated linkage which just reaches top dead center as the lip plate reaches the elevated position and locks it in that position. The linkage is mounted to move backward and thereby trip the latch upon an impact applied to the elevated lip, for example by a transport backing into the lip.

3,662,417

APPARATUS FOR THE CLEANING OF VEHICLE WHEELS

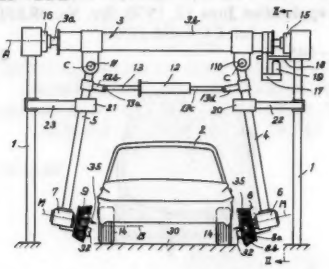
Heinrich Fuhring, Augsburg, and Richard Fleschhut, Goeggingen, both of Germany, assignors to BOWE, Bohler & Weber KG Maschinenfabrik, Augsburg, Germany

Filed July 15, 1970, Ser. No. 55,093

Claims priority, application Germany, July 19, 1969, P 19 36 906.3

Int. Cl. B60s *3/06*

U.S. Cl. 15—21 D **15 Claims**



An apparatus for the cleaning of vehicle wheels, e.g. in conjunction with a vehicle-washing installation, comprises at least one pair of rotatable brushes which can be pressed against the wheels and, for at least a limited portion of the longitudinal displacement of the vehicle, can move therewith while maintaining their rotary cleaning action.

3,662,418

VEHICLE WASHING APPARATUS

Nobuyoshi Kamiya, Takarazukashi, Japan, assignor to Toyo Enterprises KK, Osaka, Japan

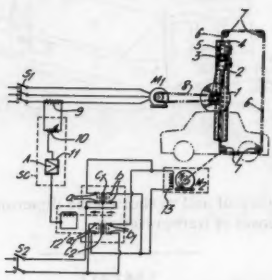
Filed July 16, 1970, Ser. No. 55,344

Claims priority, application Japan, July 17, 1969, 44/68400

Int. Cl. B60s *3/06*

U.S. Cl. 15—21 E **8 Claims**

A vehicle washing apparatus including frame-mounted overhead rotary brush assembly which can scrub the vehicle surface with a continuously applied optimum amount of scrubbing pressure, and which is caused to ascend and descend in increments as small or as large as required while



the frame travels horizontally on its track, so that a vehicle can be automatically washed from front to back via the hood, roof and trunk portions.

3,662,419

CAR WASHING APPARATUS

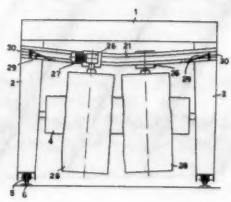
Franco Dini, via Don G. Franchini, Formigine, Modena, Italy

Filed Oct. 20, 1969, Ser. No. 867,645

Claims priority, application Italy, Mar. 7, 1969, 33534 A/69; 33535 A/69; 33536 A/69; July 1, 1969, 33598 A/69

Int. Cl. B60s *3/06*

U.S. Cl. 15—21 E **11 Claims**



Car washing apparatus comprising an arch mounted for movement longitudinally of the car, and generally vertical brushes movable transversely across the arch from each side and supported from rails which are inclined downwardly toward the center of the arch. A brush which rotates about a horizontal axis is supported for vertical movement by the side posts of the arch.

3,662,420

MACHINE FOR REMOVING CHICKEN WASTE

Tommy V. Jordan, Jr., Route 3, P.O. Box 261-F, Dade City, Fla.

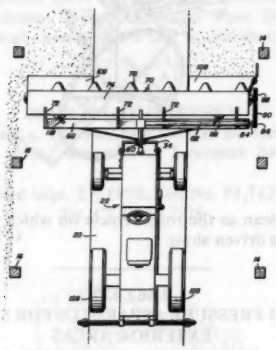
Filed Oct. 20, 1969, Ser. No. 867,601

Int. Cl. A01k *31/04*

U.S. Cl. 15—93 B **7 Claims**

An attachment for a prime mover to be moved along a path paralleling a row of elevated chicken cages beneath which chicken droppings fall to the ground. The attachment includes an elongated driven auger conveyor open along one side and supported from the prime mover in horizontal transversely extending position with its open side facing forwardly in the intended direction of movement of the prime mover. One end of the conveyor projects outwardly from the corresponding side of the prime mover for passing beneath the

cages and includes a forwardly and downwardly inclined chute for engagement with the ground beneath the cages and



directing chicken droppings upwardly toward the conveyor as the prime mover is advanced forwardly.

3,662,421

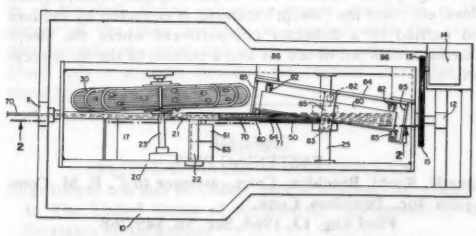
DRIVE FOR RODDING MACHINE

Charles B. Caperton, Montgomery Court Apts., Narberth, Pa.

Continuation-in-part of application Ser. No. 41,201, May 28, 1970, now abandoned , which is a continuation-in-part of application Ser. No. 835,278, Apr. 4, 1969, now Patent No. 3,561,034, which is a division of application Ser. No. 613,703, Dec. 30, 1966, now Patent No. 3,469,273. This application Sept. 25, 1970, Ser. No. 75,568

Int. Cl. B08b *1/04*

U.S. Cl. 15—104.3 SN **11 Claims**



A drive for a sewer rodding machine is disclosed which includes twist barrier means in the form of a circular arcuate surface, such as the periphery of an idler wheel, around which the rod is looped to prevent the twist of the twisting rod from getting back into the storage reel. The storage reel and torsion-taking wheel are supported for rotation in the rotatable carriage on axes which are generally normal to the axis of rotation of the carriage. In one form, the axis of rotation of the carriage is inclined relative to ground. The periphery of the torsion wheel is flanged to provide a channel, and trained about the wheel in this channel, under the rod, is a drive chain having dogs thereon at spaced intervals for driving the coupled rod. An annular freely rotatable confining band surrounds the periphery of the wheel and confines the rod in the channel against radially outward movement. The confining band is canted slightly, relative to the wheel, to allow for entry and exit of the rod.

3,662,422

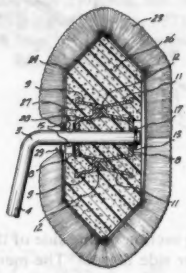
CORNER PAINT ROLLER

Robert S. Christensen, Mountlake Terrace, and Richard D. Johnson, Seattle, both of Wash., assignors to Richard D. Johnson, Seattle, Wash., by said Robert S. Christensen

Filed July 22, 1970, Ser. No. 57,274

Int. Cl. B44d *3/28*

U.S. Cl. 15—230.11 **1 Claim**



A paint roller head is composed of a rigid skeletal core embedded in a resilient molded plastic body having an annularly ridged periphery and a pile cover fitting snugly over and substantially completely enclosing the head. Such head is demountably carried on a cantilever axle integral with the shank of a handle having one portion which extends substantially centrally radially of the head and a dogleg portion connecting such radial portion and the axle root.

3,662,423

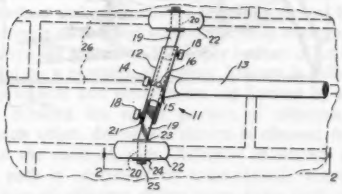
ROCK FACE BRICK CLEANING RAKE

Lloyd P. Miller, 201 Pleasant Street, Middlebury, Ind.

Filed Oct. 9, 1970, Ser. No. 79,443

Int. Cl. E04f *21/17*

U.S. Cl. 15—235.3 **9 Claims**



A rake for cleaning brick joints consisting of a tubular crossbar attached to a handle nonperpendicularly thereto so that the ends of the crossbar are offset relative to each other. Rollers are journaled to the ends of the crossbar at a spacing equal to twice the distance between brick joints, the rollers being parallel to the handle. A depending raking member is adjustably clamped to the midportion of the crossbar so as to engage in a brick joint while the rollers ride in the two outwardly adjacent parallel brick joints.

3,662,424

SCRAPING DEVICE

Jack W. Whitsett, 936 Castile Avenue, Coral Gables, Fla.

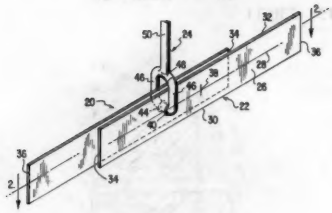
Filed Aug. 3, 1970, Ser. No. 60,434

Int. Cl. A47l *13/02*; E04f *21/10*

U.S. Cl. 15—236 **6 Claims**

A scraping device includes at least two elongated scraping members and mounting means for connecting the members to a rotating drive means, such as an electric drill, which rotates the members to accomplish scraping. The members

are each provided with an off center hole and the holes of the various members are aligned with one another and a portion of the mounting means projects therethrough. Each

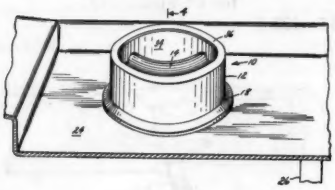


member has a long section to one side of the hole and a short section to the other side thereof. The members are disposed with the long section of one member opposite the short section of the next adjacent member, and vice versa.

3,662,425
SCRAP BLOCK

Hyman J. Klein, Closter, N.J., and Bennett W. Trupin, Brooklyn, N.Y., assignors to Instrument Systems Corporation, Jericho, N.Y.

Filed June 22, 1970, Ser. No. 47,940
Int. Cl. A22c *25/06*
U.S. Cl. 15—245 **12 Claims**



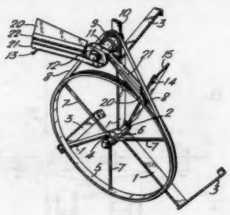
An improved scrap block for use with commercial food service equipment. An upstanding lip extends inwardly along a portion of the upper edge of the block to allow rapid removal of jelled liquids and food particles from dishware. The lower engagement wall has a circular bead detent around its outer surface to insure that the block will not be knocked out of position. The block has an annular skirt covering the receiving hole, preventing drippings getting therein.

3,662,426
MEANS FOR CLEANING MOTOR ROAD VEHICLE HEAD LAMPS

William Wharton, Piccotts End House, Hemel Hempstead, England

Filed Apr. 16, 1970, Ser. No. 29,050
Claims priority, application Great Britain, Apr. 21, 1969, 20,246/69
Int. Cl. B60s *1/44*
U.S. Cl. 15—250.22 **7 Claims**

Wiper means for a motor road vehicle headlamp comprising at least one wiper blade rotatable about a bearing adapted to be arranged centrally of the front glass of the headlamp, so that the wiper blade automatically keeps such



front glass clean as the road vehicle on which the headlamp is mounted is driven along

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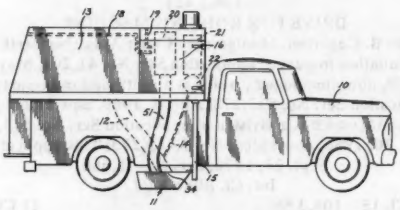
3,662,427
VACUUM-PRESSURE APPARATUS FOR SWEEPING EXTERIOR AREAS

Bruce Hanna, Littleton, Colo., assignor to American Coleman Company, Littleton, Colo.

Filed July 1, 1970, Ser. No. 51,518
Int. Cl. A47l *5/14*
U.S. Cl. 15—346 **8 Claims**

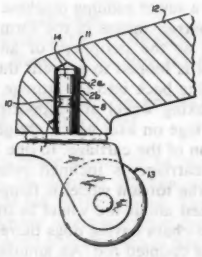


An apparatus using a high-pressure air stream in an open-ended chamber to dislodge dust, pebbles and other debris from large planar surfaces such as parking lots, roads, streets, alleys, etc., and the "swept" material is collected by vacuum and carried to a collector compartment where the swept material settles out of the air and a portion of the air is recycled.

3,662,428
FASTENING PINS

Hans H. Koehl, Brooklyn, Conn., assignor to C. E. M. Company, Inc., Danielson, Conn.

Filed Aug. 13, 1969, Ser. No. 849,768
Int. Cl. B60b *33/00;* **A47b** *91/00;* **F16m** *11/20*
U.S. Cl. 16—43 **11 Claims**



A fastening pin, comprising a coil wound sheet material providing an external resilience and having an inner end por-

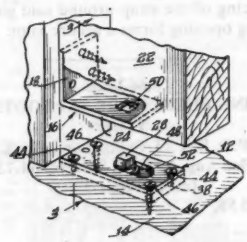
tion on the inner surface thereof terminating in an edge extending along its length, the end portion including the edge at least in part spaced from the sheet material wound thereunder constituting an interior inwardly, radially directed bump formation providing an independent interior resilience. The spirally wound sheet material has a diametric thickness through the bump formation smaller than the diametric thickness through the rest of the coil wound sheet material.

3,662,429

DOOR PIVOT ASSEMBLY

Larry K. Johnson, Lyndon, and Delmar D. McNinch, Rock Falls, both of Ill., assignors to Lawrence Brothers, Inc., Sterling, Ill.

Filed Sept. 23, 1970, Ser. No. 74,712
Int. Cl. E05d *7/08*
U.S. Cl. 16—151 **9 Claims**



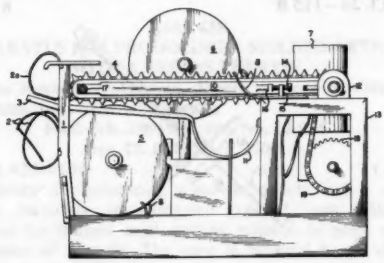
The present invention relates generally to pivot assemblies for swinging doors, and more particularly to improvements in pivot assemblies for use with door members, the pivoted vertical edge of which, when the door is in closed position, is in substantial abutting relation with a vertical door frame. An embodiment of the invention disclosed herein includes a crank arm, a link member having one end pivotally connected with the crank arm, mounting means for supporting the crank arm and link member upon a horizontal door frame member. Fixed pivot means is associated with the mounting means and is connected with the opposite extremity of the link. Crank actuating means attachable to the corner of the door member is coupled with the crank member whereby when the door member swings about the crank axis in a given direction the vertical door edge will move away from the door frame.

3,662,430

SPLITTING MACHINE FOR CHICKEN

E. J. Lloyd, and Rex E. Childs, both of Athens, Ga., assignors to The United States of America as represented by the Secretary of Agriculture

Filed Feb. 3, 1970, Ser. No. 8,214
Int. Cl. A22c *21/00*
U.S. Cl. 17—11 **2 Claims**



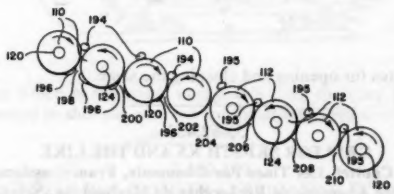
An apparatus and process are disclosed wherein the assembled components position, secure, and convey eviscerated carcasses of chicken and the like fowl past rotary knives to split the said carcasses into two parts (halves) efficiently and safely.

3,662,431

SCALLOP PROCESSING

Elmer Dryden Willis, Williston, N.C.

Original application May 27, 1968, Ser. No. 732,247, now Patent No. 3,562,855, dated Feb. 16, 1971. Divided and this application Mar. 11, 1970, Ser. No. 23,528
Int. Cl. A22c *29/00*
U.S. Cl. 17—48 **4 Claims**



A method and apparatus are provided for extracting the adductor muscle from scallops. Scallops are subjected to a heat shock and are then mechanically agitated to disengage the muscle and attached viscera from the shell. The muscle and viscera are removed from the shells and separated from unfragmented portions of the shells on a vibrating screen and are then contacted with water before being separated from small shell fragments by flotation in a brine solution. Viscera is removed from the muscles by pulling on the viscera while restraining movement of the muscles. The invention also includes a method and apparatus for removing viscera from the adductor muscle of shucked scallops. Scallop muscles and attached viscera are placed on the upper surface of an inclined path formed by a plurality of rollers. Viscera is pulled from the scallop muscle and through the nip formed by adjacent rollers by rotating the upper portion of adjacent rollers towards each other. Detached viscera is cleaned from the rolls below the inclined path. Advance of scallop muscles down the path is controlled by intermittently rotating the upper portion of adjacent rollers away from each other to permit the lower of the adjacent rollers to advance the muscle down the path and by spraying a flow of fluid on at least some of the muscles on the path to effect their rate of movement down the path.

3,662,432

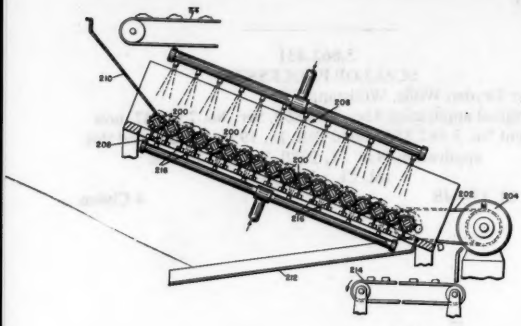
APPARATUS FOR EVISCERATING SCALLOPS

Richard T. Wenstrom, Hampton, Va., and Thomas S. Gorton, Jr., Cambridge, Mass., assignors to Slade Gorton & Co., Inc., Boston, Mass.

Original application July 17, 1967, Ser. No. 659,274, now abandoned. Divided and this application Sept. 14, 1970, Ser. No. 71,730
Int. Cl. A22c *29/00*
U.S. Cl. 17—53 **2 Claims**

A method and apparatus for shucking raw uncooked unfrozen shellfish of the bivalve type which includes the method of opening the shells by shocking the shellfish, clean-

ing the viscera from the edible muscle of the shellfish and the apparatus for opening and cleaning the same.



3,662,433

GRIP FOR SKI-STICKS AND THE LIKE

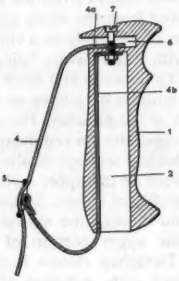
James Couttet, Les Tines Par Chamonix, France, assignor to Societe Anonyme de Recherches de Mechanique, Saint-Vallier sur Rhone (Drome), France

Filed Dec. 22, 1970, Ser. No. 100,726

Claims priority, application France, Jan. 12, 1970, 7000868

Int. Cl. A63c *11/22*

U.S. Cl. 24—68 AS **2 Claims**



A grip which allows the skier to hold said grip directly so that he may release the latter in the case of an emergency, for instance if he drops off a ski lift and the ski-stick is entangled with the latter. To this end, the grip carries a tassel the outer ends of which are secured respectively to the upper and lower ends of the actual grip. Thus the skier passes four fingers through the gap left between the tassel and the grip so as to grasp the grip with said fingers, his thumb remaining outside said grip.

3,662,434

PLASTIC LOOP TIE CLOSURE FOR BAGS

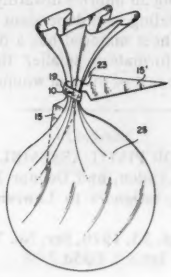
William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation

Filed May 25, 1970, Ser. No. 40,031

Int. Cl. B65d *77/10*

U.S. Cl. 24—30.5 P **2 Claims**

A plastic tie device for easily, quickly, and securely loop closing the gathered folds of a flexible bag opening is provided. The tie device comprises a flexible elongated strap having a center portion narrower than the end portions such that an interlacing of the strap around said gathered folds of said flexible bag opening forms a secure knot.



3,662,435

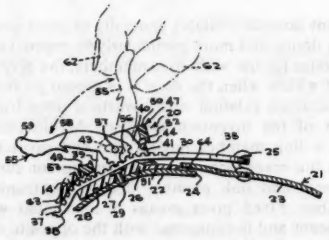
RATCHETING BUCKLE FOR SKI BOOTS AND THE LIKE

Ivor J. Allsop, P.O. Box 23, Bellingham, Wash.

Filed Aug. 6, 1970, Ser. No. 61,733

Int. Cl. A43c *11/00*

U.S. Cl. 24—70 SK **11 Claims**



A ratcheting buckle for ski boots that includes a manually operated means or member for adjusting the device, and wherein the ratcheting buckle will remain in its desired adjusted position, and wherein buckling and unbuckling of the ski boot by the skier will be facilitated.

3,662,436

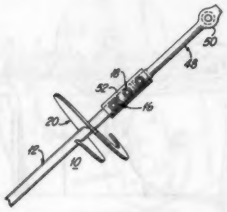
SCREW ANCHOR

Kenneth Ralph Roza, Chicago, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Dec. 28, 1970, Ser. No. 101,624

Int. Cl. E02d *5/74*

U.S. Cl. 24—115 B **6 Claims**



A screw anchor used in securing a guy wire to the ground includes at least one helical cutting blade attached to a

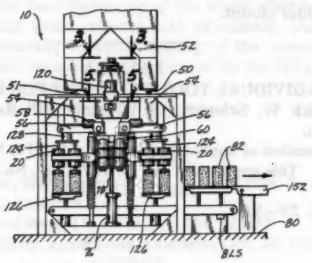
generally square-shaped shaft, one end of which is pointed to facilitate the insertion of the screw anchor into the ground. Located near the other end of the shaft is a generally circular cross-sectional groove which forms an installation hub out of the other end of the shaft, and which is designed so that the torsional ultimate strength of the shaft at the groove is less than the torsional yield strength of the full square-shaped shaft. Extension rods are connectable to the end portion of the shaft forming the installation hub for increasing the length of and securing the guy wire to the screw anchor.

3,662,437

APPARATUS FOR MAKING HOLLOW CONCRETE ARTICLES

Virgil L. Long, Sr, Jefferson, Iowa, assignor to Mid-Iowa Concrete Products Co., Jefferson, Iowa

Filed May 14, 1970, Ser. No. 37,122
Int. Cl. B28b *21/12*
U.S. Cl. 425—147 **9 Claims**



A machine having a rotatable and vertically movable table which includes four tile molds of four tiles each ninety degrees apart around the periphery of the table. A concrete source is provided at molding stations 180° apart while ejecting means are provided at oppositely disposed stations 180° apart. The table is rotated back and forth between the molding and ejecting stations. While two sets of tile, four each, are being formed two sets of tile, four each, are being ejected. The forming of the tile and the ejecting occur simultaneously as the table is raised and lowered relative to vertically stationary packer heads at the molding station and vertically stationary ejecting means at the ejecting station. A moisture sensitive probe automatically controls the concrete supply to provide the desired quantity of concrete at the molding stations.

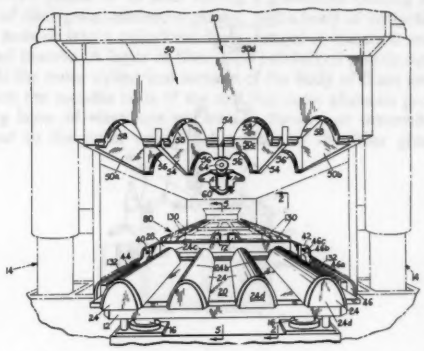
3,662,438

APPARATUS FOR PRODUCING A MOLDED ARTICLE WITH A RECESS THEREIN

Magame Koyama, Yokohama, Japan, assignor to Columbia Machine, Inc., Vancouver, Wales

Filed Feb. 20, 1970, Ser. No. 12,915
Int. Cl. B28b *7/18, 3/00*
U.S. Cl. 425—186 **7 Claims**

Apparatus for producing a molded article with a recess therein including an elongated tapered core which is mounted for limited axial shifting relative to parts which form sides of a mold. The core is adapted to be shifted between one position which it occupies during molding of an article, and another (partially retracted) position wherein it is free from an article in the mold. Movement of a pallet to a position forming one of the sides of the mold shifts the core toward the first position mentioned. A ram carrying an element which is releasably engageable from the core may be operated to shift the core toward the other position.

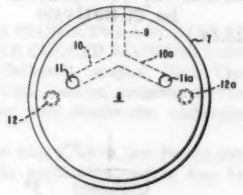


3,662,439

STUFFER BOX CRIMPER LUBRICATING SYSTEM

J. A. G. Baken, Lwyndrecht, Netherlands, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Aug. 18, 1970, Ser. No. 64,737
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.6 **1 Claim**



In a stuffer-box crimper for textile fibers having cooperating crimper rolls, a stuffer box associated with said crimper rolls to accommodate the entry of said fibers and an assembly of crimper disc and crimper disc holder positioned on each side of the nip of said crimper rolls in such manner that said crimper discs are maintained in contact with the edges of said crimper rolls, the improvement wherein said crimper disc and said crimper discs holder have conduits therein which are aligned such that lubricant can be passed through said conduits to the areas of said contact.

3,662,440

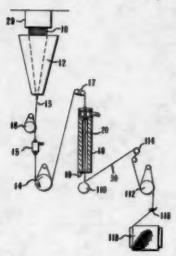
PROCESS FOR CONTROLLING YARN TENSION AND THREADLINE STABILITY DURING HIGH SPEED HEAT TREATING OF THE YARN

William Green Hill, and Whorley William Maxey, both of Bassett, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 17, 1970, Ser. No. 64,219
Int. Cl. D01d *5/22;* **B29c** *25/00*
U.S. Cl. 28—72.17 **9 Claims**

A process for heat treating yarn that includes the steps of feeding the yarn into a stream of heated gas, causing the gas to convey the yarn in a first path while heating it, and subsequently changing the direction of advance of the yarn from said first path to a second path that intersects said first path, is modified to improve threadline stability without increasing

tension in the zone where the yarn path changes direction. The modification includes the steps of: interposing a surface in the first path and withdrawing the yarn from the proximity of the surface in the direction of said second path at a rate to provide a single sharp change in direction at said surface toward said second path.



3,662,441

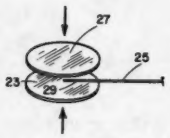
METHOD OF MAKING DRY ELECTRODES

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Frank B. Ramme, 1403 West Kerrick, Lancaster, Calif.

Original application Aug., 1968, Ser. No. 760,389, now Patent No. 3,547,105, dated Dec., 1970. Divided and this application Oct. 7, 1970, Ser. No. 78,704

Int. Cl. H01j *9/00*

U.S. Cl. 29—25.14 5 Claims



Dry electrodes useful for attachment to individuals made by mixing silver powder with a cement, diluting the mixture with a suitable solvent for the cement and applying it in a thin layer to a surface from which it can be removed as a film when dry; cutting or shaping the dried film to form the size electrodes desired; placing a wire lead on the cut film piece; applying a small amount of solvent to the film surface having the wire thereon; and pressing a second piece of the dried film thereto to form the electrode of the invention.

3,662,442

VERTICAL TURRET MACHINE TOOL

Fritz Noa, Rheydt-Odenkirchen, Germany, assignor to Maschinenfabrik Froriep GmbH, Rheydh/Rheinland, Germany

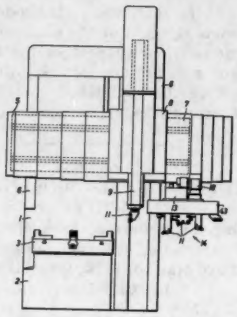
Filed July 1, 1969, Ser. No. 838,236

Claims priority, application Germany, July 2, 1968, P 17 52 681.7

Int. Cl. B23q *3/155*

U.S. Cl. 29—26 14 Claims

A vertical turret machine tool having an indexable tool holder store capable of carrying a number of tool holders whereby by suitable indexing of the store, any selected tool holder can be transferred between the store and a movable tool holder mount.



3,662,443

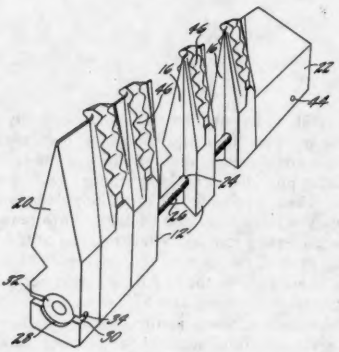
INDIVIDUAL TOOTH ELEMENT FOR BROACH

Frederick W. Schmidt, 19 Windmill Hill Road, Branford, Conn.

Continuation of application Ser. No. 716,919, Mar. 28, 1968. This application Feb. 2, 1970, Ser. No. 7,960

Int. Cl. B26d *1/04*

U.S. Cl. 29—95.1 9 Claims



The present invention presents individual interlocking cutting elements which are adapted to be combined in an interdependent relationship to create a form broach. Each individual cutting element is adapted to interlock with a neighboring cutting element by a male and female V-groove interlock structure which forms a part of each tooth.

3,662,444

INDEXABLE CUTTING INSERT AND HOLDER THEREFOR

Donald S. Erkfritz, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

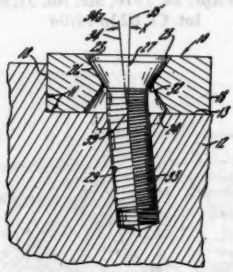
Filed Mar. 9, 1970, Ser. No. 17,605

Int. Cl. B26d *1/00*, *1/12*

U.S. Cl. 29—96 7 Claims

A flat and centrally apertured wafer-like insert of cutting material provides a plurality of angularly spaced available cutting tips and is located edgewise against angularly related abutments upstanding from the inner edge of a supporting surface or platform against which the insert is clamped in the

final seating in a conical end of the insert aperture of the mating conical head of a screw extending through the insert aperture and threading into a hole in the platform. The insert aperture is larger than the screw shank, and the outer end of the screw hole axis is inclined relative to the axis of the insert



cone at a small angle and toward the abutment corner. As a result and in the final tightening of the screw after edgewise camming of the insert against said abutments, the screw shank bends laterally to allow seating of the coned screw head in the insert recess around substantially the full peripheries of the mating cones.

3,662,445

LATHE TOOLS

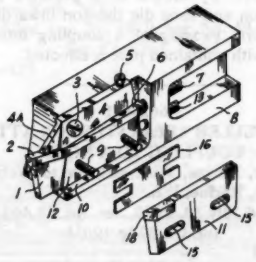
Derek Whitaker, 6/60 George Street, Marrickville, New South Wales, 2204, Australia

Filed Sept. 15, 1970, Ser. No. 72,337

Claims priority, application Australia, Oct. 20, 1969, 62578/69

Int. Cl. B26d *1/00*

U.S. Cl. 29—97 **3 Claims**



A parting off tool has a cutting tip which is clamped between a lower blade member and the front of an upper clamping member. The clamping is effected by rotating the clamping member about a pivot point using a screw adjustment made on the rearward part of the clamping member, the blade member being held stationary. The cutting tip is adjustable using a pusher rod bearing against the rear face of the tip. A chamfer cutting blade can be mounted alongside the blade member so that the same tool can be used both for parting off and also for putting a chamfer on the workpiece left in a lathe. The combined operation can be performed simultaneously in some instances.

3,662,446

LIGHTWEIGHT ROLL CONSTRUCTION

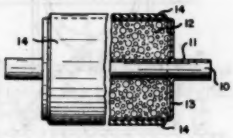
Harold D. Walls, White Twsp. Cty. of Ind., Pa., assignor to McCreary Industrial Products Co., Indiana, Pa.

Filed Feb. 25, 1971, Ser. No. 118,907

Int. Cl. B21b *31/08*

U.S. Cl. 29—130 **10 Claims**

The specification discloses a lightweight construction for rolls of the composite type employed in corrosive environments and other environments in which minimal weight or low inertia is a favorable factor. Various constructions are disclosed comprising a central core or shaft of fiber glass reinforced plastic or of steel having a protective coating or layer of fiber glass reinforced plastic, and a body of syntactic foam molded into a cylindrical form coaxial to the shaft and bonded thereto. A layer of fiber glass reinforced plastic surrounds the outer cylindrical surface of the body of foam and protects the annular ends of the roll. An outer abrasion protecting layer of elastomer material is bonded or otherwise secured to the outer cylindrical surface of the fiber glass



plastic layer. The syntactic foam comprises nodules or spheres of glass, epoxy or phenolic material suspended in a matrix of thermosetting resin, in various degrees of density. One arrangement employs a matrix consisting of thermosetting resin and microspheres of glass, epoxy, phenolic or other material. Another arrangement employs a matrix of thermosetting resin with other reinforcing agents such as fibers of glass, boron, graphite, steel or asbestos. A further variation employs a matrix in which a blowing agent, such as azodicarbonomide is introduced into a thermosetting resin with an activator such as oxalic or acetic acid.

3,662,447

METHOD FOR PRODUCING A NOZZLE-LOAD FOR A WATER COOLED BLOWING LANCE

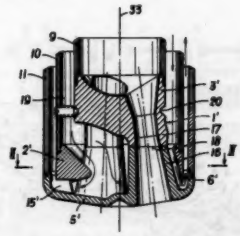
Otto Schweng; Hellmuth Smejkal, Hans Vereb, and Karl Eicher, all of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellscaft, Linz, Austria

Filed Aug. 5, 1970, Ser. No. 61,090

Claims priority, application Austria, Aug. 14, 1969, A 7830/69

Int. Cl. B21d *53/00;* **B21k** *29/00;* **B23p** *15/26*

U.S. Cl. 29—157 C **7 Claims**



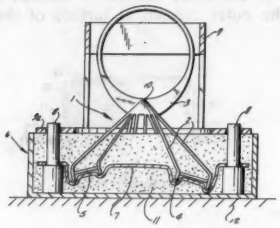
The disclosure relates to a nozzle-head for a water-cooled blowing lance comprising at least one outlet opening for a gaseous refining agent and, if desired, fine-grained fluxes, an inlet piece, at least one nozzle tube leading through a water-cooled space and a front plate to which the at least one nozzle tube is connected, in which the improvement resides in that both the inlet piece and the front plate are provided with tubular projections which are connected with each other to form said nozzle tubes, the connection plane lying perpendicularly to the nozzle-head axis at a distance from the front plate amounting to about one-fourth to two-thirds of the height of the nozzle-head. The number of connecting seams corresponds to the number of nozzle tubes; the seams are far away from the front plate and thus sheltered from any danger to damage.

3,662,448

PROCESS OF MANUFACTURING ORNAMENTS

Reinhold Heckel, Strietweg 15, Pforzheim, Germany

Filed May 15, 1970, Ser. No. 37,798
Claims priority, application Germany, June 4, 1969, P 19 28 535.9
Int. Cl. B21f *43/00*; B23p *13/00*
U.S. Cl. 29—160.6 8 Claims



An ornament is manufactured with the aid of an element composed of horizontal wires which form a stone mount, and vertical wires which cross and are joined to the horizontal wires to form upstanding tips and depending legs. The element is placed onto a die with the legs extending upwardly, a base thermally bonded to the legs, and a stone is engaged with and fixed by the tips.

ERRATUM

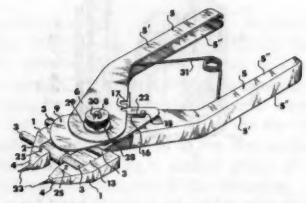
For Class 29—207.5 SL see:
Patent No. 3,663,000

3,662,449

PLIERS

Seiichi Hashimoto, 4-21 Honmachi, Higashiosaka-shi, Osaka, Japan

Filed Mar. 30, 1970, Ser. No. 23,581
Claims priority, application Japan, Dec. 1, 1969, 44/97024
Int. Cl. B25b *27/20*
U.S. Cl. 29—229 3 Claims



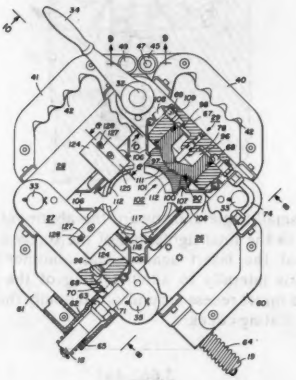
Pliers for contracting or expanding snap rings include pivotally connected handles spring biased apart. The handles are coupled to movable jaws by pivotable cam plates. The jaws are guided to move linearly toward and away from each other by parallel slide members. The cam plates carry slidable pins engaging first notches in the handles for moving the jaws apart when the handles are brought together. The pins can engage second notches in the handles for moving the jaws together when the handles are brought together. Other pins having stepped stem portions for engaging holes in ends of snap rings are carried by the jaws.

3,662,450

HAND-PORTABLE PRESS FOR SWAGABLE PIPE COUPLING

George D. Kish, Derrick City; Robert P. Montesi, and Gerald B. Smith, both of Bradford, all of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 24, 1970, Ser. No. 31,711
Int. Cl. B23p *19/04*
U.S. Cl. 29—237 11 Claims



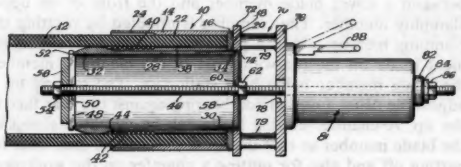
A hand-portable press having hydraulically extendable shoe forming dies for swaging a pipe coupling into pipe joint formation with a contained pipe section. Each die is separately mounted for articulated movement on the inward end of a hydraulically moveable piston and is arcuate on its innermost face with which swaging is effected. Application of hydraulic pressure, by means of a portable hand pump, forces each piston and shoe die thereon inwardly until concentrically uniform swaging of a coupling into a pressure tight pipe joint with contained pipe is effected.

3,662,451

HYDRAULIC PULLER APPARATUS FOR ATTACHING A COUPLING TO A HOSE

John B. Wagner, Racine, Wis., assignor to Webster Electric Company, Inc., Racine, Wis.

Filed July 30, 1970, Ser. No. 59,461
Int. Cl. B23p *19/04*
U.S. Cl. 29—237 9 Claims

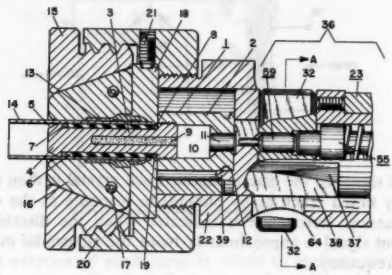


A coupling or fitting is attached to one end of a hose by means of a novel attachment mechanism. Attachment is accomplished by placing a fitting over the end of the hose and by pulling on an internal portion of the fitting. The novel attachment mechanism uses a hydraulic puller to pull on the internal portion of the fitting. A pull cap and a pull shaft are used to connect the internal portion of the fitting to the hydraulic puller and the pulling is quickly carried out hydraulically. When the pull shaft is then pushed back into the hose, the pull cap automatically disengages and the entire attachment mechanism is removed through the fitting.

3,662,452
PORTABLE SWAGING GUN

Donald M. Stonestrom, West Chester, Pa., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

Filed Mar. 20, 1970, Ser. No. 21,296
Int. Cl. B21d *26/08*
U.S. Cl. 29—282 8 Claims

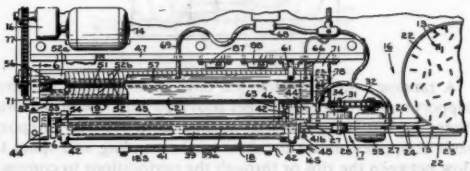


A gun for holding a sleeve on a tube and for firing an explosive cartridge placed within the tube. The gun has a collet for gripping the sleeve, a firing pin positioned to fire the cartridge, and a sudden-release cam which cocks and releases the firing pin. A safety device is also provided to prevent accidental firings.

3,662,453
METHOD OF AND APPARATUS FOR STRIPPING HEAT SHRINKABLE MATERIAL FROM A RELATIVELY RIGID ARTICLE

John R. Meal, Naperville, and Gregory H. Smith, Wheaton, both of Ill., assignors to Western Electric Company Incorporated, New York, N.Y.

Filed Apr. 21, 1970, Ser. No. 30,474
Int. Cl. B23p *19/02*
U.S. Cl. 29—427 6 Claims



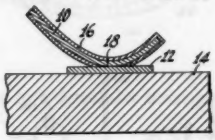
In stripping heat shrinkable sheathing material from an elongated metallic article, the material is scored along the length of the article. The article next is positioned in a nest defined by a pair of juxtaposed rollers and the material is heated so that it shrinks and separates along its scored portion. The rollers then are rotated to strip the material from the article and to discharge the material from the nest through the rollers, after which the stripped article is removed from the nest.

3,662,454
METHOD OF BONDING METALS TOGETHER

Anthony Zbigniew Miller, Flemington, N.J., assignor to RCA Corporation

Filed Mar. 18, 1970, Ser. No. 20,538
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 3 Claims

A body of a soft metal, such as gold, silver, or copper, is ultrasonically bonded to another metal body by providing a thin layer of a harder material, such as nickel, iron, cobalt, magnesium, aluminum, palladium, germanium, or silicon, between the surface of the soft metal body and the other metal body. The layer of the harder material is thin enough



that it is worn away during the application of the ultrasonic energy so as to provide the bond directly between the soft metal body and the other body.

3,662,455
METHOD FOR PREPARING AN ANTI-OXIDIZING, ACTIVE ALLOY BRAZING COMPOSITION

Glenn A. Anderson, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

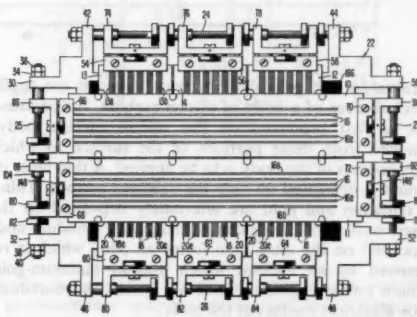
No Drawing. Filed Dec. 10, 1970, Ser. No. 97,019
Int. Cl. B23k *31/02*
U.S. Cl. 29—473.1 16 Claims

There is herein disclosed a nickel-titanium-niobium alloy for effecting improved high temperature metal-to-ceramic and ceramicgto-ceramic braze bonds which are resistant to hot alkali metal vapor and which also provide an oxidation resistant coating.

3,662,456
FLEXIBLE CIRCUIT ALIGNING FIXTURE

Allan F. Walter, Exton, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 27, 1970, Ser. No. 40,821
Int. Cl. H05k *13/04, 3/32*
U.S. Cl. 29—203 J 10 Claims



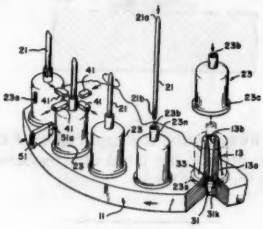
A fixture for aligning elongate flexible tapes containing electrical conductors. The tapes are accurately adjusted longitudinally and transversely, and are arranged in a lattice which later is to become part of a thin film magnetic memory apparatus. The tapes are held securely in the lattice so that undesirable shifting of the tapes is eliminated or substantially reduced.

3,662,457

METHOD OF FORMING BEVEL ORIENTED NEEDLE ARRANGEMENT

Kenneth W. Gores, Bellevue, Wash., assignor to MPL, Inc., Chicago, Ill.

Filed Oct. 10, 1969, Ser. No. 865,237
Int. Cl. B21d 39/00; B23p 11/02
U.S. Cl. 29—508 8 Claims



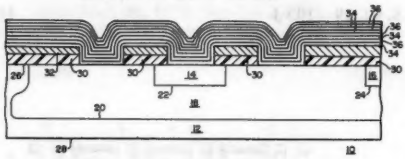
A needle and hub unit having a beveled needle or canula point for insertion into a patient, the unit having indicia thereon indicating the orientation of the beveled insertion point; and a method and apparatus of orienting the marketing such beveled needle units by combined vibrational and camming of the canula and thereupon marking the assembled unit.

3,662,458

ELECTRICAL CONTACT FOR SILICON CARBIDE MEMBERS

Napolean P. Formigoni, Pittsburgh, and John S. Roberts, Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 20, 1969, Ser. No. 835,017
Int. Cl. B01j 17/00; H01j 1/14, 5/02
U.S. Cl. 29—591 7 Claims



Tantalum and gold alloy electrical contacts are applied to selected areas of a body of silicon carbide. An oxidized surface is first produced on the silicon carbide body and removed from those portions of the surface to which the alloy contact of the body is to be applied. A thin layer of aluminum is deposited on only the oxidized surface. Thin films of tantalum and gold are alternately deposited on the exposed surface of the silicon carbide. Any tantalum and gold deposited on the aluminum forms an alloy which is readily removed by an etchant which attacks tantalum-gold-aluminum intermetallics but will not attack the tantalum-gold alloy electrical contact of the body.

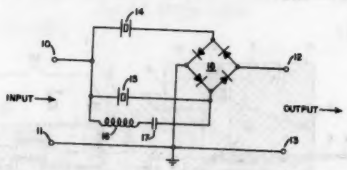
3,662,459

METHOD FOR TUNING DISCRIMINATORS

Frederick E. Spangler, and Daniel L. Wetherell, both of Lynchburg, Va., assignors to General Electric Company

Filed Apr. 1, 1970, Ser. No. 24,723
Int. Cl. H03j 3/12
U.S. Cl. 29—593 5 Claims

In a discriminator that utilizes one or more piezoelectric crystals, the crystals are tuned to resonate at a desired frequency after being connected in the discriminator, since the capacity of the discriminator components is not determinable prior to being used. The tuning includes frequency modulating a carrier signal of the desired frequency with a selected sinusoidal signal, and applying this frequency-modulated signal to the discriminator. Each crystal is then respectively tuned (such as by plating) to resonate at the desired frequency. Resonance is indicated when the discriminator output signal is approximately twice the sinusoidal modulating frequency.

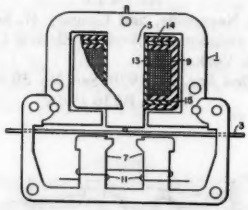


3,662,460

METHOD OF MAKING A RANDOM WOUND ENCAPSULATED COIL

Thomas J. Daley, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original application Aug. 8, 1967, Ser. No. 659,216, now Patent No. 3,559,134. Divided and this application Oct. 20, 1970, Ser. No. 82,444
Int. Cl. H01f 7/06
U.S. Cl. 29—605 8 Claims



A random winding is located on a spool having a central support and having end flanges provided with ribs or perforations. An insulating material in fluid form such as an epoxy resin is applied under pressure to the winding and spool to flow between the ribs or through the perforations to compact the winding. This provides a continuous layer of the insulant in contact with end windings and assures good resistance to electric breakdown. Insulant may be introduced in a similar way between the central spool support and the winding.

3,662,461

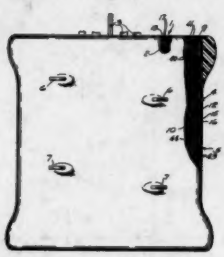
METHOD OF MAKING DRY INSULATED INDUCTIVE COIL

Glen W. Lake, Greensboro, N.C., and Myron D. Coerper, Charlottesville, Va., assignors to Chemetron Corporation, Chicago, Ill.

Original application Dec. 2, 1968, Ser. No. 780,355. Divided and this application May 4, 1970, Ser. No. 34,110
Int. Cl. H01f 7/06
U.S. Cl. 29—605 10 Claims

A high voltage dry-insulated transformer includes a primary coil having a multiple turn, multiple layer winding constructed by alternately winding a coil layer and then insulation sheets or tape on a winding form. The insulation sheet is a non-woven glass filament cloth which is impregnated with a semi-cured epoxy resin. A plurality of insulating cloth layers

are wrapped about the primary coil to define the necessary intercoil insulation. The secondary coil is then similarly formed. The interlayer and intercoil insulating cloth extends beyond the axial end faces of the coils and the space is filled by wrapping of a corresponding tape between the two extended layers. The cloth is applied under tension and heat



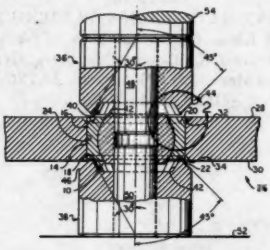
and the exterior of each layer is rolled to exclude air and cause the resin to flow into the voids and crevices. After the formation of each coil or coils, the assembly is cured by heating under pressure and vacuum. The exterior is wrapped with a shrink type Mylar and the ends of the assembly are capped to confine the insulating resin during the curing and processing cycle.

3,662,462

METHOD OF SECURING A BEARING RACE WITHIN A BORE IN A HOUSING

Robert H. Shiflet, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Feb. 9, 1970, Ser. No. 9,689
Int. Cl. B21d *53/10*; B23p *11/00*
U.S. Cl. 29—149.5 B **6 Claims**



An annular shoulder which retains a bearing race in a bore is deformed in two steps in each of which the annular, beveled edge of a staking anvil is pressed into a groove which defines one side of said shoulder. In the first deforming step the staking side of the beveled edge of the staking anvil is disposed at an angle of 45° relative to the axis of the aforesaid bore. In the second deforming step the staking side of the beveled edge of the staking anvil is disposed at an angle of 60° relative to said bore axis, and greater pressure is exerted against the shoulder.

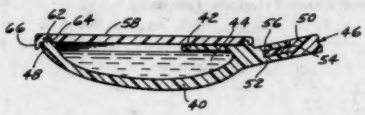
3,662,463

SPOON

Meyer Ushkow, and David Elliot Ushkow, both of 75-04 196th Place, Flushing, N.Y.

Continuation-in-part of application Ser. No. 793,522, Jan. 23, 1969, now abandoned. This application Aug. 22, 1969, Ser. No. 852,287
Int. Cl. A47j *43/28*
U.S. Cl. 30—326 **8 Claims**

This invention provides a spoon for the marketing of material contained therein, the bowl thereof being incompletely enclosed by a partial wall member, said bowl



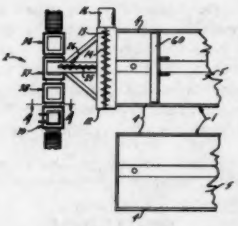
being fully closed by a detachable cover-piece removably affixed to the bowl.

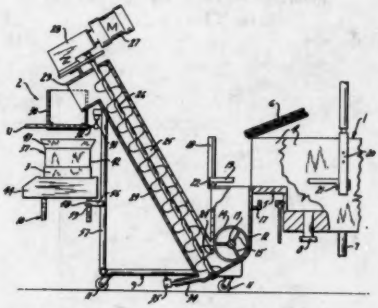
3,662,464

VAT UNLOADING AND HOOP FILLING APPARATUS FOR CHEESE CURD

Norman J. Peters, Fond du Lac, Wis., assignor to DEC International, Inc., Madison, Wis.

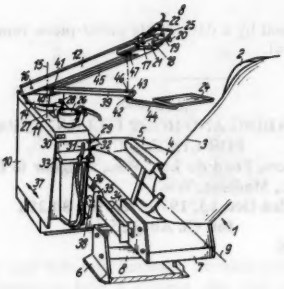
Filed Oct. 13, 1970, Ser. No. 80,291
Int. Cl. A01j *25/13*
U.S. Cl. 31—46 **9 Claims**





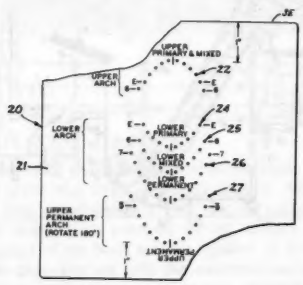
A device for unloading cheese curd from a vat, weighing out a predetermined quantity of the curd and pre-pressing the curd within a hoop. The device includes a movable frame having a hopper adapted to be positioned adjacent the open end of the vat, and the curd is pushed out of the open end of the vat by a blade mechanism into the hopper. An upwardly inclined auger conveys the curd from the hopper and discharges the curd into a hoop located at a weighing station on the frame. After the desired weight of curd has been discharged into the hoop at the weighing station, the hoop is moved across a conveyor on the frame to a pre-pressing station where a platen acts to compress the curd within the hoop.

3,662,465
DENTAL TREATMENT ASSEMBLIES
Erich Heubeck, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany
Filed Oct. 20, 1969, Ser. No. 867,512
Claims priority, application Germany, Oct. 26, 1968, P 18 05 515.7
Int. Cl. A61c 19/02
U.S. Cl. 32—22 7 Claims



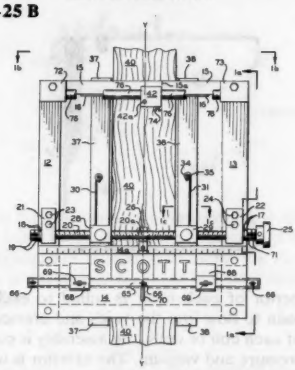
A dental treatment assembly comprises a patient's chair and a dental treatment unit supported by the chair which is mounted on a base for adjustment in a generally vertical direction relatively to the base. The dental treatment unit includes a housing, a dental hand appliance support arm pivotally connected to the upper surface of the housing and a dental spittoon unit mounted on the upper surface of the housing.

3,662,466
DENTAL DAM
Richard S. McConville, 2525 Bailey Avenue, San Jose, Calif.
Filed Apr. 5, 1971, Ser. No. 131,251
Int. Cl. A61c 5/12
U.S. Cl. 32—34 18 Claims



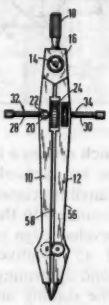
Premarked dental dams and devices for marking dental dams, are mechanisms that are employed for locating holes to be selectively pierced by the dentist in the dental dam through which teeth protrude. The markings follow the average alignment of teeth as they appear in the dental arch. The patterns of the markings of the teeth of the lower arch are located on the dental dam with respect to the superior edge of the dental dam. One group of patterns represents the primary, mixed and permanent dentition for a 5-inch × 5-inch dental dam. Another group of patterns represents the primary, mixed and permanent dentition for a 6-inch × 6-inch dental dam. The pattern of the group selected for a particular arch is dependent on the tooth of that particular arch to be clamped.

3,662,467
ENGRAVING APPARATUS
Richard W. Schmutzler; Merton E. Scott; Kenneth J. Page, and Edgar S. Van Buren, all of Walton, N.Y., assignors to Scott Machine Development Corporation, Walton, N.Y.
Filed Oct. 30, 1970, Ser. No. 85,666
Int. Cl. B43l 13/10
U.S. Cl. 33—25 B 8 Claims



A pantograph engraver workpiece clamp having a pair of clamping arms each pivotally mounted on respective traveling nuts carried on oppositely threaded portions of a clamping screw, with springs biasing the clamp arms toward a reference direction and the arms extending past scale markings, so that a tapered workpiece may be easily clamped with its centerline aligned relative to an engraving tool reference position and relative to a line of engraving type.

3,662,468
PRECISION COMPASSES OR DIVIDERS
Karl Kolb, and Klaus Glombitza, both of Nurnberg, Germany, assignors to J. S. Staedtler, Nurnberg, Germany
Filed Mar. 31, 1970, Ser. No. 24,286
Int. Cl. B43l 9/00
U.S. Cl. 33—27 B 18 Claims



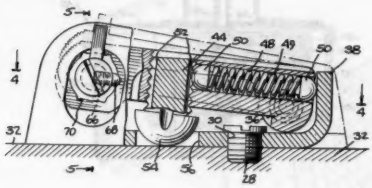
Compasses or dividers having legs connected by a rod which engages the legs with right-handed and left-handed threads respectively and carries a knurled, central adjusting wheel are equipped with a brake for impeding rotation of the rod. The threads on the latter have a pitch sufficient to permit the legs to be moved freely toward and away from each other for coarse adjustment and thereby to rotate the rod when released by the brake. When the latter is applied, the rod can be turned only by means of the adjusting wheel for a fine adjustment which cannot be disturbed by forces acting on the legs. Numerous brake mechanisms are disclosed.

3,662,469

GUN SIGHT

Dwayne W. Charron, Chicopee, Mass., assignor to Bangor Punta Operations, Inc., Greenville, Conn.

Filed Apr. 9, 1970, Ser. No. 26,871
Int. Cl. F41g *1/16, 1/44*
U.S. Cl. 33—47 10 Claims



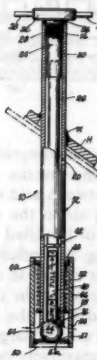
A gun sight is disclosed having means for vertical and horizontal adjustment of a sighting notch mounted on the gun sight.

3,662,470

DIPSTICK ASSEMBLY

Peter J. Sasgen, Forest Park, Ill., assignor to Power Parts Company

Filed Sept. 2, 1970, Ser. No. 68,880
Int. Cl. G01f *23/04*
U.S. Cl. 33—126.7 4 Claims



An oil level dipstick assembly provides a check valve that effects an air seal when the dipstick is removed, but which valve is open when the dipstick is in place to permit the stick to reliably measure the oil level in an oil reservoir for an apparatus having moving parts therein, even when the apparatus is in operation.

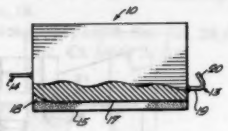
3,662,471

MEASURING TAPE AND CHALK LINE HOLDING TOOL

Michael W. Lynde, 13830 N.W. 5th Avenue, North Miami, Fla.

Filed Mar. 17, 1970, Ser. No. 20,344
Int. Cl. G01b *3/10*
U.S. Cl. 33—137 3 Claims

A rectangular block weight such as a heavy metal is provided with hooks at each end for selectively attaching one end of a measuring tape or chalk line. The underside of the block weight has a friction-grip surface to minimize slippage. The over all length of the block weight tool is such that accurate measurement can be made from a vertical surface and along a horizontal surface by abutting one end of the tool against the vertical surface and adding a whole number of



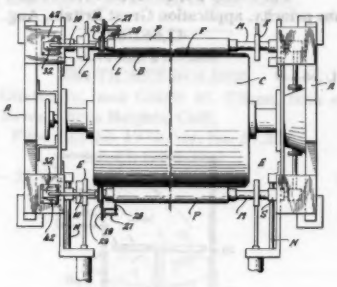
inches to the measurement taken, said whole number being representative of the measured distance occupied by the device.

3,662,472

TEMPLET FOR USE IN PLACING A SET OF PRINT ROLLS IN FIT

James Reid Johnson, Stonington, Conn., assignor to The Johnson Fast Print Corporation, Brooklandville, Md.

Filed Feb. 3, 1969, Ser. No. 795,941
Int. Cl. B41b *1/00*
U.S. Cl. 33—184.5 10 Claims



For successively placing the print rolls of a set in a cloth printing machine comprising a number of print rolls spaced at even distances around a backing cylinder a templet is provided which has means at one end for attachment to the machine frame at positions spaced apart similarly to the spacing of the print rolls. At its other end the templet has an offset arm carrying a pointer with which to align a pitch mark on a roll being set in a fit. The pointer is mounted on a ring segment coaxially disposed with two coactive calibrated ring segments by the manipulation of which the correct rotary angle of the pointer for setting the print rolls successively at the correct rotary angles is indicated.

3,662,473

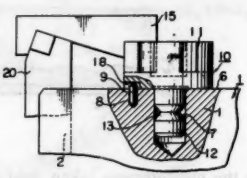
METHOD OF AND A DEVICE FOR POSITIONING A CUTTING TOOL ON A TOOL REST OF A MACHINE TOOL

Kazuo Ito, and Hiroyuki Yotsubayashi, both of Kawasaki, Japan, assignors to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1969, Ser. No. 882,193
Int. Cl. B27g *23/00;* G01b *5/20*
U.S. Cl. 33—185 2 Claims

A gauge plate carrier having a number of slots on one of its end surfaces is detachably secured to a tool holder at a predetermined position. A gauge plate having a gauge surface suitably shaped so as to conform to the tip of a cutting tool to be set is put on the tip of the cutting tool previously and precisely set on the tool holder so that a portion thereof

lies in the slot of the gauge plate carrier and is rigidly secured to the carrier. When the setting of a cutting tool on the tool



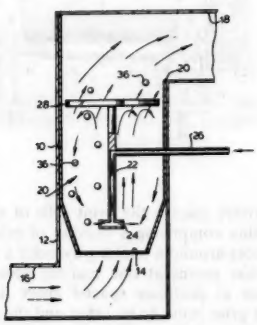
holder is required, it is carried out on the basis of the gauge plate which is firmly held on the tool holder by securing the gauge plate carrier to it.

3,662,474

DRYERS AND METHOD OF OPERATION

John Alan Huthwaite, Stoke-On-Trent, England, assignor to Calmic Engineering Company Limited, Crewe, Cheshire, England

Filed Aug. 24, 1970, Ser. No. 66,339
Claims priority, application Great Britain, Aug. 27, 1969, 42,662/69
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 16 Claims



There is disclosed a method and apparatus for drying materials such as pastes and slurries in which the material is coated onto discrete bodies which are fluidized by an upward stream of gaseous drying agent, the dried material being continuously removed from the fluidized bodies by impacts arising from the motion of the fluidized bodies.

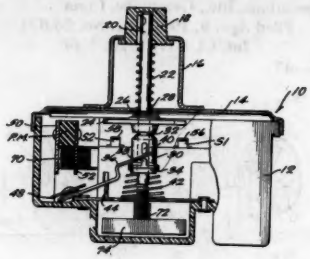
3,662,475

MAGNETICALLY LATCHED SWITCH AND CIRCUIT THEREFOR

Wilbert E. Beller, Park Ridge, and Abed G. Kahale, Roselle, both of Ill., assignors to Controls Company of America, Melrose Park, Ill.

Filed Feb. 21, 1967, Ser. No. 617,630
Int. Cl. F26b *19/00*; H01h *9/20*
U.S. Cl. 34—45 1 Claim

The switch-selector shaft is depressed to move latch plate against core magnetized by permanent magnet. This actuates various switches depending upon rotary position of the shaft. The termination pulse from the moisture sensing control passes through a coil to set up a counter magnetic field to



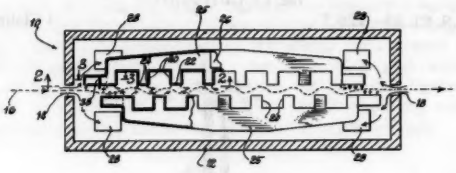
allow a spring to move the latch and shaft to inactive position restoring switches to their normal positions.

3,662,476

AIR FLOW CONTROL STRUCTURE FOR WEB DRIERS

Victor T. Capizzi, Chicago, Ill., assignor to B. Offen & Co., Inc., Chicago, Ill.

Filed Dec. 30, 1970, Ser. No. 102,760
Int. Cl. F26b *13/00*
U.S. Cl. 34—156 7 Claims



A web drier construction comprising a housing having inlet and outlet openings and means for teansporting a web through the housing between said openings. Air nozzles are positioned for applying air to the web so that ink or other material on the web will be dried during movement of the web through the housing. A conduit structure feeds air to the nozzles, and an exhaust means is connected to the housing for withdrawing air from within the housing. The nozzles which are positioned adjacent the inlet and outlet openings carry extensions having air discharge openings which operate to produce air flow transversely relative to the web movement. This air flow operates to disrupt the longitudinal air streams which flow from the nozzles toward the inlet and outlet openings. The extensions, therefore, assist in eliminating the discharge of air from the housing into the atmosphere surrounding the housing.

3,662,477

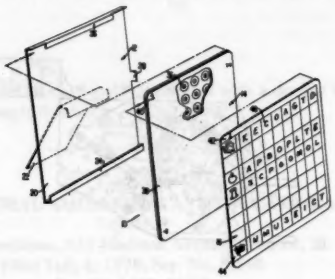
EDUCATIONAL AID

Harold Weinstein, 1820 Avenue V, Brooklyn, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,594
Int. Cl. G09b *1/08*
U.S. Cl. 35—9 R 12 Claims

An educational aid including a coded card and a problem card containing a plurality of educational problems and the answers thereto superimposed and aligned on an easel. The coded card includes a plurality of magnetic and non-magnetic portions. The magnetic portions are arranged so as to lie in back of individual indicum on the problem card which if selected by a student as an answer to an educational problem will provide a composite answer. The student selects the individual indicum by placing a magnet on the problem card covering the selected indicum. Should the indicum

selected be correct, the magnet will adhere to the problem card. Otherwise, it will slide from the card indicating immediately to the student that the particular indicum selected



is incorrect. The coded card is rectangular in shape and therefore can be rotated through 90° intervals to present a different relative orientation of the magnetic and non-magnetic portions for use with a plurality of problem cards.

3,662,478

SOLE AND HEEL OF RUBBER OR PLASTIC

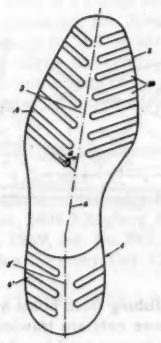
Johann Schwab, Vienna, Austria, assignor to Semperit Osterreichisch-Amerikanisde Gummiwerke Aktiengesellschaft, Vienna, Austria

Filed Jan. 28, 1970, Ser. No. 6,348

Claims priority, application Austria, Jan. 28, 1969, A 863/69

Int. Cl. A43b *13/18*

U.S. Cl. 36—59 C **8 Claims**



The invention concerns a rubbery or plastic sole having a tread profile with at least one essentially longitudinal rib at a distance from the sole edge, and is characterized by transverse and/or inclined ribs that branch off said longitudinal rib and/or the central line of the sole, towards the tip of the shoe or form an angle α of not more than 90° wherein said transverse and/or inclined ribs embrace grooves not communicating with each other. These grooves may be bent, have varying depth and/or width over their length, and have arcuate or semicircular cross section; transverse and/or inclined ribs may ramify; longitudinal ribs may be provided at the edge of the sole.

3,662,479

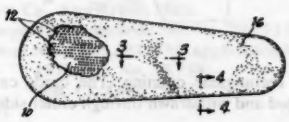
FIBER SURFACED GARMENT AND FABRIC PRESSING DEVICE

Joseph Airdo, Skokie, Ill., assignor to Bishop Freeman Company, Evanston, Ill.

Filed Apr. 15, 1970, Ser. No. 28,586

Int. Cl. D06f *71/36*

U.S. Cl. 38—66 **7 Claims**



A pressing member for pressing machines and the like having an expansive pressing surface. The member presents to a garment to be pressed a fiber pressing surface constituted by a large number of short individual fibers per square inch bonded to the member by an intermediate layer of heat and moisture resistant adhesive. The pressing member may be a press plate, and may be perforated to pass steam.

3,662,480

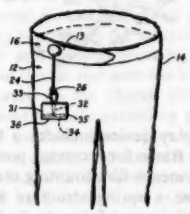
SKI TICKET HOLDER

Ronald J. Gilson, Jr., and Goldie M. Gilson, both of 7017 Raintree Drive, Citrus Heights, Calif.

Filed July 22, 1970, Ser. No. 57,236

Int. Cl. G09f *3/08*

U.S. Cl. 40—20 R **1 Claim**



Depending from a pad permanently secured to the waistband of a pair of ski pants is a pig tail having a loop on the bottom end to receive the bail of a typical wire wicket to which a ski ticket is affixed. The pig tail is long enough so that the ski ticket hangs below the bottom of a ski jacket far enough to be readily seen by the ski lift attendant without the skier's having to lift up the bottom of the jacket to show the ticket.

3,662,481

CARD FILE

Robert B. Lewis, Jr., 3222 Military Avenue, West Los Angeles, Calif.

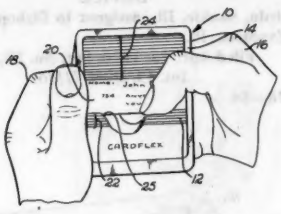
Filed July 10, 1970, Ser. No. 53,757

Int. Cl. G09f *11/30*

U.S. Cl. 40—65 **2 Claims**

A compact, personal size file in which a plurality of miniature file cards are aligned in almost total overlap in an open frame. The frame includes a pair of channeled members

receiving the ends of the file cards on opposite sides of a generally rectangular opening. The cards can be inserted, manipulated and withdrawn through either side of the file.



3,662,482

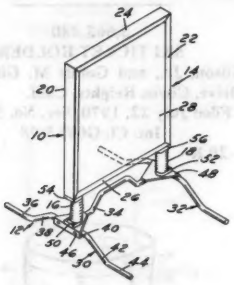
POSTER DISPLAY DEVICE

Robert Sarkisian, 8644 Woodside Park Drive, Oak Park, Mich.

Continuation-in-part of application Ser. No. 670,511, Sept. 11, 1967. This application July 30, 1970, Ser. No. 19,213

Int. Cl. G09f *7/22*

U.S. Cl. 40—125 H **3 Claims**



The poster display device includes a base upon which is mounted a poster frame for receiving posters and like advertising media. The means for mounting the poster frame onto the base comprise a spring structure interconnecting the lower portion of the poster frame to the base at at least two points. The poster frame normally extends vertically upwardly from the base. The surface area of the frame is relatively large. The spring structure upon which the frame is mounted permits the frame to deflect downwardly upon the application of a force thereto, as for example, the wind when the structure is located out-of-doors. The frame may deflect in either direction without danger of tipping the base. The stronger the applied force, the more the frame will deflect downwardly thus reducing the component of any force tending to topple the display device. Further, the frame size, center of gravity and base size are so dimensioned as to prevent tipping as a result of gravity leverage after the frame has been deflected by the wind.

3,662,483

FIREARM FIRING MECHANISM WITH A DISCONNECTOR PIVOTABLY MOUNTED ON THE GEAR

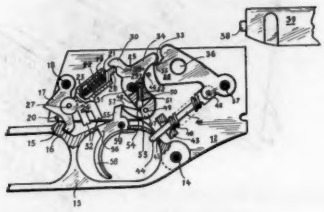
Louis W. Seecamp, 561 Whitney Avenue, New Haven, Conn.

Filed Oct. 29, 1970, Ser. No. 84,956

Int. Cl. F41c *19/00*

U.S. Cl. 42—69 B **7 Claims**

A firing mechanism for firearms in which the sear spring is mounted so that its point of engagement with the sear can be switched farther from, or nearer to, the pivotal axis of the sear in order to increase or decrease the trigger pull. The sear spring is also mounted so that when the firing mechanism is used in a lever action, the sear spring also urges the latch for the finger lever into latching position. A disconnector is pivoted on the sear for rotation in one direction only with respect thereto, so that when the trigger engages the engagement surface on the disconnector, the firing mechanism is operable. After the gun is fired and while the trigger is pulled, the actuating lug on the trigger engages a convex surface on the underside of the disconnector pivoting it on the sear out of its operative position with respect thereto.



3,662,484

METHOD AND APPARATUS FOR FISHING

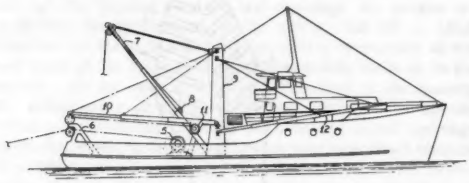
Johannes Karel Dres, Beaconsfield, Quebec, Canada, assignor to Canadian Vickers Limited, Montreal, Quebec, Canada

Filed May 18, 1970, Ser. No. 38,399

Claims priority, application Canada, Mar. 10, 1970, 077,020

Int. Cl. A01k *73/02*

U.S. Cl. 43—4.5 **12 Claims**



A method of fishing from boats and apparatus therefor in which one or more nets are trawled astern of the boat and trawl booms are maneuvered in a horizontal arc to bring the nets close along side the boat to enable the cod ends of the nets to be lifted inboard for unloading on the deck.

3,662,485

FISH LURE

Philip J. Klemkowski, Jr., 1146 Hull Street, Baltimore, Md.

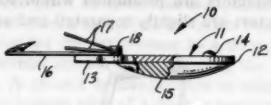
Filed Nov. 12, 1969, Ser. No. 875,979

Int. Cl. A01k *85/04*

U.S. Cl. 43—42.34 **1 Claim**

A lure device for the various thermal layers of water to the moderate layers of water. The device is of such construction so as to wobble and lurch over the uneven bottom and is colored to resemble the normal food of the species being sought.

The device consists of a flat body having a rounded sinker

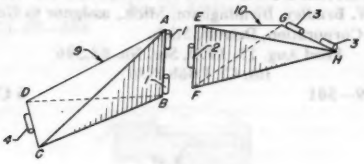


portion attached thereto and is equipped with a double weed guard and a single fish hook.

3,662,486
POLYHEDRAL AMUSEMENT AND EDUCATIONAL DEVICE

Edward J. Freedman, 532 Madison Avenue, Glencoe, Ill.

Filed Feb. 4, 1970, Ser. No. 8,510
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 R **6 Claims**

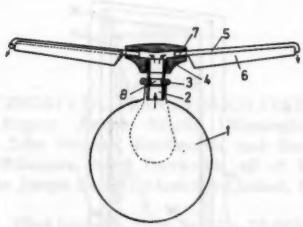


A series of polyhedrons are removably and rotatably connected to each other to form a series. Each polyhedron has an edge which lies in a plane perpendicular to a plane containing either an opposite edge, as in the case of a tetrahedron, of a point, as in the case of a trihedron. The opposite edges, or edge and opposite point are adapted to contain hinge elements which may be removably and rotatably connected. When in the form of a closed loop, containing at least four connected polyhedrons, the device is capable of being continuously turned up to 360° inside itself to form a multitude of geometrical shapes and configurations. For any given closed loop, the geometric form of the configurations is dependent upon the number and type of polyhedrons employed.

3,662,487
BALLOON-TYPE AIRCRAFT TOY

Uwe C. Seefluth, Selstrasse, 2409 Klingberg, Germany

Filed Oct. 9, 1969, Ser. No. 865,144
Claims priority, application Germany, Oct. 12, 1968, P 18 02 813.2
Int. Cl. A63h *29/16*
U.S. Cl. 46—44 **13 Claims**

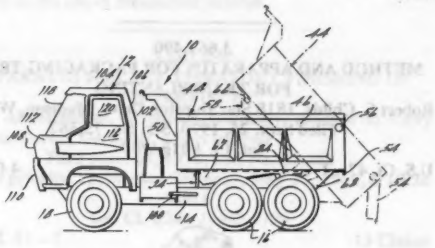


The balloon-type aircraft toy according to the invention includes an inflatable balloon adapted to be filled with compressed gas having its interior communicating via ducts with the outer ends of rotor blades releasably secured to a rotor hub in such a manner that the pitch angle of the blades may be adjusted. At the ends of the blades the compressed gas is deflected and discharged out of nozzles thereby forming a reaction-type drive for rotating the blades. The rotor blades are made of a plurality of self-supporting interconnected light weight bodies, such as molded bodies of foamed synthetic resin or hollow bodies made of bent foils of plastic material.

3,662,488
TOY VEHICLE

Robert Stanley Linstead, Rockford, Ill., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.

Continuation-in-part of application Ser. No. 782,113, Dec. 9, 1968, now Patent No. 3,605,331. This application May 19, 1970, Ser. No. 38,758
Int. Cl. A63h *17/05*
U.S. Cl. 46—201 **32 Claims**



A toy vehicle comprising a chassis portion, a body portion and at least two steerable wheels; the chassis portion being provided with a steering mechanism including a tie rod extending generally laterally thereof, means supporting the tie rod for lateral sliding movement, a pair of kingpins disposed adjacent the opposite ends of the tie rod, means supporting the kingpins for pivotal movements about generally vertical axes, means rotatably supporting the steerable wheels on the kingpins, and pivot arm means pivotably connecting the laterally outer ends of the tie rod with the kingpins; the body portion being supported on the chassis portion for relative tilting movement about an axis extending generally longitudinally of the chassis portion, whereupon tilting of the body portion relative to the chassis portion effects lateral sliding movement of the tie rod, with the further result that the kingpins will be pivoted in a manner so as to effect steering movement of the vehicle wheels; the vehicle having the chassis and body portions initially, substantially preassembled and adapted to be operatively connected by merely snappingly engaging a pair of resilient bearing members provided on the body portion into engagement with a longitudinally extending pivot member or shaft provided on the chassis portion.

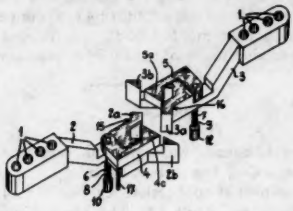
3,662,489
AUTOMATIC COUPLING FOR ROLLING STOCK OF MINIATURE RAILWAYS

Pierre Terrier, 6 rue Thiers, 38 Grenoble, France

Filed Feb. 23, 1971, Ser. No. 118,113
Int. Cl. A63h *19/00*
U.S. Cl. 46—216 **4 Claims**

In a coupling of the so-called "jaw" type for miniature railway rolling-stock the two shafts to be mutually coupled are pivoted to the ends of cars or trucks, and each is provided with a male portion and a substantially V-shaped female portion, and with a hook adapted to pivot in a horizontal plane and urged towards the relevant shaft for engagement behind a lateral projection carried by the companion shaft; said hook further being mounted for axial sliding movement in relation to its shaft on a rod carrying a coil spring having the dual function of urging said hook towards its shaft and

downwards, to ensure the automatic coupling, so that when said rod is pushed upwards by suitable uncoupling means



provided on the track the two cars involved are uncoupled in the traction direction but still capable of being pushed on the track.

3,662,490

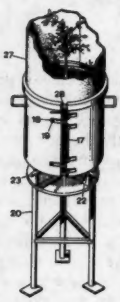
METHOD AND APPARATUS FOR PACKAGING TREES FOR TRANSPLANTING

Robert S. Childs, 1818 Star Dunston Drive, Madison, Wis.

Filed Sept. 25, 1970, Ser. No. 75,367

Int. Cl. A01g *9/08*

U.S. Cl. 47—1 **4 Claims**



A pair of semi-cylindrical shells hingedly secured at one edge and releasably secured at the other edge to form a digging cylinder about the trunk of a tree. The cylinder is driven into the ground and removed with the soil and roots of the tree therein. A bottom packaging disc is placed on a packing stand and the loaded digging cylinder is placed on radially protruding retractable support pins on the stand. A tubular packaging sleeve is attached to the top flange of the digging cylinder. When the support pins are retracted and the digging cylinder is pushed downward about the legs of the packing stand the packaging sleeve is drawn downwardly about the soil and roots of the tree and onto the bottom disc. The bottom disc is wired to the packaging sleeve to complete the packaging of the tree.

3,662,491

SAFETY DEVICE FOR ELECTRICAL WINDOW REGULATORS

Paul Boyriven, Paris, France, assignor to Compagnie Industrielle de Mecanismes, Courbevoie, France

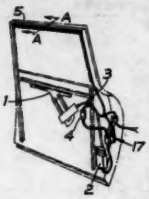
Filed Jan. 8, 1970, Ser. No. 1,468

Claims priority, application France, Jan. 14, 1969, 6900405

Int. Cl. E05f *15/08*

U.S. Cl. 49—28 **3 Claims**

A safety device for a motor-operated window regulator used for raising and lowering the window of a vehicle including an elongated sheath which is elastically deformable located outside the plane of the window for detecting the presence of an obstacle hindering the closure of the window. Electric conductors are positioned within such sheath and such conductors are slightly separated and adapted to contact each other upon a light deformation of the sheath by such obstacle. A device is responsive to the contact of the conductors for reversing the operation of the motor thereby preventing any risk of accidental closure of the window.



3,662,492

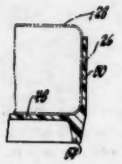
INSULATED DOOR WITH REVERSIBLE COVER

Thomas W. Bradley, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1970, Ser. No. 64,396

Int. Cl. E06b *3/30*

U.S. Cl. 49—501 **6 Claims**



An insulated refrigerator door is made from a rectangular metal sheet having wide flanges on four sides to which is connected a plastic inner door pan. The space in between is filled with polyurethane foam insulation. A molded flanged rectangular plastic member fits over the metal sheet and its flanges in two alternate positions located 180° apart. The metal sheet is fitted for hinging on either side. The plastic member is provided with an integral door handle adjacent one side usable in the proper position with either hinging of the door.

3,662,493

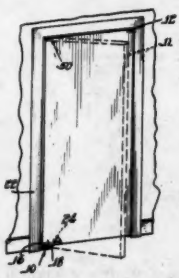
DOOR PIVOT DEVICE

Robert E. Foltz, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Filed July 7, 1970, Ser. No. 52,854

Int. Cl. E05d *7/08*

U.S. Cl. 49—388 **5 Claims**



The present invention relates generally to double acting pivot devices for doors mounted between top and bottom

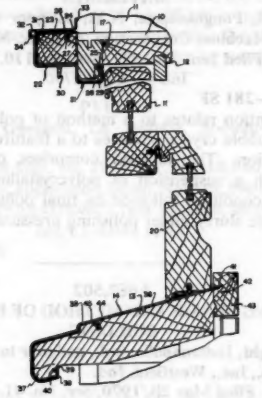
pivots aNd more particularly to improvements in vertically adjustable bottom pivot devices. One embodiment of the invention disclosed herein comprises a bracket member having a vertical section for the attachment to a door jamb, and a lateral or horizontal section for supporting the weight of a door member. A second bracket means is adapted for attachment to the bottom edge of a door in superimposed relation with respect to the horizontal section of the first bracket member. Interposed between these superimposed bracket sections is an antifriction bearing device of improved practical construction which may be vertically adjusted without the necessity of first separating the door member from its supporting pivot.

3,662,494

PLASTIC SHEATHED WINDOW FRAME

Charles K. Sitterly, Dubuque, Iowa, assignor to Scovill Manufacturing Company

Filed May 27, 1970, Ser. No. 40,849
Int. Cl. E06b *1/04*
U.S. Cl. 49—504 **1 Claim**



A protected edge structure device for a wall opening such as a window opening comprising a window frame extending around the opening and attached to the window at the opening edge and comprising a sill, opposite side jambs and a head and a resilient plastic sheath having an inner surface closely embracing the frame at the outer and upper sides of the sill, side jambs and head and including members for retaining the sheath in position including integral barbs on the sheath engaging kerfs in the frame.

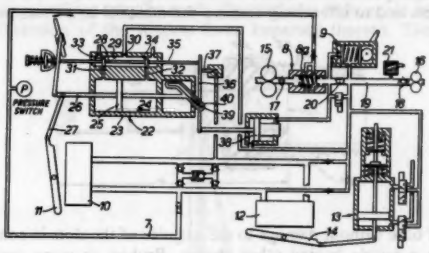
3,662,495

HYDROSTATIC TRANSMISSION SYSTEMS

Anthony Eugene Joseph Martin, Birmingham; Robert Thomas John Skinner, Kenilworth, and Bernard James Baker, Wilnecote, Near Tamworth, all of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Sept. 17, 1970, Ser. No. 73,066
Int. Cl. F02b *41/00*
U.S. Cl. 60—19 **9 Claims**

A hydrostatic transmission in which a pump displacement varying unit controlled by a servo valve is in turn controlled by a lever movable in one direction by a pump output pressure sensing device and in the other direction by a motor speed sensing device. The unit has a feedback connection to



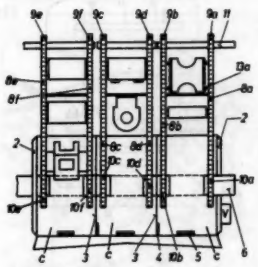
the lever which varies the position of the fulcrum of the lever relative to the above mentioned devices.

3,662,496

APPARATUS FOR THE VIBRATORY FINISHING OF WORKPIECES

Georg Altenstaedter, Griefstedt, Germany, assignor to Terry Lewis, Berlin, Germany, a part interest

Filed Mar. 24, 1970, Ser. No. 22,268
Claims priority, application Germany, May 27, 1969, P 19 26 920.6
Int. Cl. B24b *19/00, 1/00*
U.S. Cl. 51—7 **13 Claims**



A work container is filled with a polishing or grinding medium and workpieces are mounted to an auxiliary device which transports the workpieces into, through and out of the medium. A vibrator is mounted to the container for vibrating the polishing medium and circulating it in a predetermined direction through the container. The auxiliary device can be moved by the circulating medium or by independent drive means. A secondary work container can be mounted to the interior of the main container and a mixture of small workpieces and polishing medium can be fed through the secondary container while large pieces are carried through the main container by the auxiliary device.

3,662,497

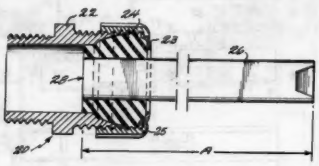
ABRASIVE MOTOR SLOT CLEANING NOZZLE

Thomas L. Thompson, 1138 Niskey Lake Rd., S.W., Atlanta, Ga.

Filed Nov. 2, 1970, Ser. No. 86,265
Int. Cl. B24c *3/06*
U.S. Cl. 51—11 **3 Claims**

A nozzle for removing material such as burned shellac, paper residue, insulation, dirt, grease, etc. from stator slots of electric motors preparatory to rewinding and a method of removing such material with such a nozzle. In the embodiment described below, the nozzle includes an oblong hollow ceramic member which is force fitted at one end into a rubber stopper and has its other end beveled for fitting into

the slots and a metal coupler for connecting the member to a suitable sand blasting source. The beveled end and oblong shape permit the nozzle to be easily inserted in the stator slots and to effectively remove the material in a short period



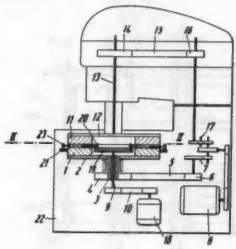
of time without damage to the exterior of the slots in contrast to a nozzle having other shapes. Broken or worn ceramic members can be easily and quickly replaced by removal from the stopper and force fitting a new ceramic member in place.

3,662,498

REDRESSING OF LAPS IN LAPPING OR HONING MACHINES

Willi Caspers, Mettmann, Germany, assignor to Peter Wolters Kratzenfabrik und Maschinenfabrik, Mettmann am Rhineland, Germany

Filed Aug. 26, 1969, Ser. No. 853,143
Claims priority, application Germany, Aug. 29, 1968, P 17 97 055.7
Int. Cl. B24b *5/00, 53/02*
U.S. Cl. 51—118 **3 Claims**



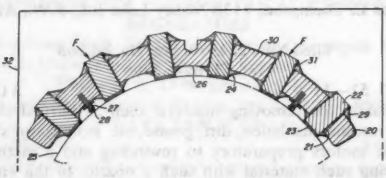
The annular working surfaces of cast-iron laps in a two-lap lapping or honing machine are redressed by three or more redressing units each having an abrading ring surrounded by and secured to a gear which constitutes the planet pinion of a planetary transmission. The redressing units can be used interchangeably with gear-shaped workholders and their rings remove material from the working surfaces when the gears are rotated about their respective axes while the laps rotate in opposite directions.

3,662,499

ADJUSTABLE LAP

Ronald Aspden, Bedford, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Dec. 18, 1969, Ser. No. 886,235
Int. Cl. B24d *3/00*
U.S. Cl. 51—204 **18 Claims**



An adjustable lap for the fine grinding of optical and other surfaces. A plate with a plurality of holes therein supports a like plurality of rods positioned within said holes. Each rod has a grinding pellet mounted on one end thereof, which end extends a predetermined distance outwardly of the holes. An adhesive is provided to mount the rods to the plate such that the extended portion of each rod will be maintained at the predetermined distance to permit accurate grinding of the surface.

3,662,500

METHOD FOR POLISHING MAGNETIC OXIDE MATERIALS

Eric Mendel, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1971, Ser. No. 110,779
Int. Cl. B24b *1/00*
U.S. Cl. 51—281 SF **10 Claims**

This invention relates to a method of polishing magnetic oxides or bubble crystal surfaces to a featureless and strain-free condition. The method comprises pre-polishing or lapping with a suspension of polycrystalline garnets to a conchoidal condition followed by final polishing with a silicon dioxide alkaline slurry under polishing pressure not in excess of about 20 psi.

3,662,501

METHOD FOR POLISHING MAGNETIC OXIDE MATERIALS

Eric Mendel, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1971, Ser. No. 110,780
Int. Cl. B24b *1/00*
U.S. Cl. 51—281 SF **9 Claims**

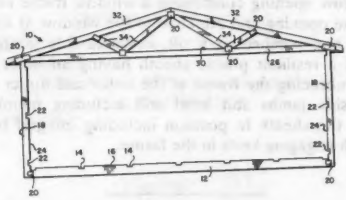
This invention relates to a method of polishing magnetic oxides or bubble crystal surfaces to a featureless and strain-free condition. The method comprises pre-polishing or lapping with a suspension of polycrystalline garnets to a conchoidal condition followed by final polishing with a zirconium oxide slurry under polishing pressure between 2 and 40 psi.

3,662,502

BUILDING FRAME AND METHOD OF ERECTING A BUILDING

Jay D. Wright, Indianapolis, Ind., assignor to Truss Manufacturing Co., Inc., Westfield, Ind.

Filed May 28, 1970, Ser. No. 41,442
Int. Cl. E04b *7/12*
U.S. Cl. 52—93 **5 Claims**



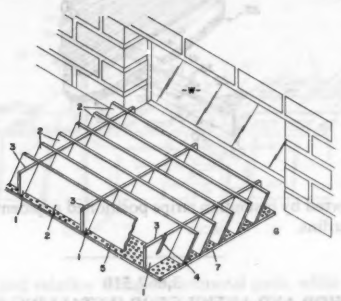
An assembled frame for a building and a method of erecting a building therewith. A pre-assembled frame includes a floor joist, wall studs, ceiling chord, and the frame for the upper floor also has roof chords. The floor joist and wall studs have notches formed in their inwardly presented surfaces which are adapted to interfit with stringer members. The frames are adapted to interfit with notched mud sills. The pre-formed and pre-notched parts may be readily and unerringly assembled at the construction site by fitting a frame into the notches at one end of the mud sills and temporarily supporting it, then adding an adjacent second frame and placing a stringer member therebetween. Successive frames are added in like manner until the structure is completed.

3,662,503

DEVICE FOR PREVENTING MUD OR DIRT SPLATTER AGAINST WINDOWS AND SIDES OF A BUILDING

Ladd C. Praisler, 3121 Hamilton Road, Rt. 6, Medina, Ohio

Filed Apr. 13, 1970, Ser. No. 27,922
Int. Cl. E02d *31/00, 31/06*
U.S. Cl. 52—97 5 Claims



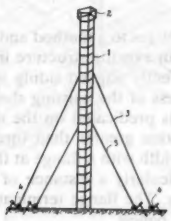
A device, in the form of a grill, is provided for preventing mud or dirt splatter against the windows and sides of a building during a rainfall. The device is made of interlocked strips, with one set of strips slanted or inclined downwardly and away from the window or building to direct the rainfall away from the window or building. A modification includes placement of a perforated plate or sheet under the device to inhibit the growth of weeds into the spaces formed by the grill.

3,662,504

PYLONS

Michel M. F. Gueguen, La Tuilerie, St-Nom-la-Breteche, France

Filed Mar. 10, 1970, Ser. No. 18,040
Claims priority, application Japan, Nov. 10, 1969, 44/89333; June 2, 1970, 45/46897; June 17, 1970, 45/59477
Int. Cl. E04d *15/00*
U.S. Cl. 52—123 3 Claims



A process of erection of a temporary pylon and a carriage used for such erection is disclosed.

Erection of a temporary pylon is obtained by stacking and joining sections which are in the form of straight prisms having a polygonal base.

The invention is characterized by a support for guiding the mast which serves the purpose of putting the prismatic sections into place by a vertical climbing movement over the whole height of the pylon, so as to bring the structural sections successively to the top of the pylon.

3,662,505

GROUND ANCHOR

Hikoitsu Watanabe, and Sanji Genma, both of 1-chome, Ehara-cho, Nakano-ku, Tokyo, Japan

Filed Nov. 4, 1970, Ser. No. 86,814
Claims priority, application Japan, Nov. 10, 1969, 44/89333; June 2, 1970, 45/46897; June 17, 1970, 45/59477
Int. Cl. E02d *5/80*
U.S. Cl. 52—164 8 Claims

A ground anchor comprises a resistance plate consisting of some bendable sections driven slantly to a direction from a predetermined depth by the coaction of driving force and soil resistance applied thereto during driving operation so that they are set in such a manner that their maximum effective resisting surfaces may be easily directed at a right angle with the direction of the tension force imparted thereto. These

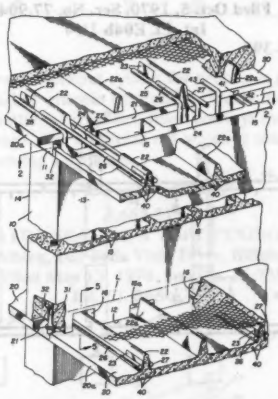
bendable sections are kept straight by means of a regulating rod so as to be driven straightly inward until they reach the predetermined setting depth, and start bending at the predetermined depth, when the control of the regulating rod is released from outside at any time, so as to be inclined and driven inward to any required direction.

3,662,506

UNITIZED BUILDING STRUCTURE UTILIZING PRECASE COMPONENTS

Thomas J. Dillon, 692 Woodbrook Rd., Cuyahoga Falls, Ohio

Filed Jan. 12, 1970, Ser. No. 2,177
Int. Cl. E04b *1/16, 5/16*
U.S. Cl. 52—251 3 Claims



A unitized building and a method of mass-producing the same that features the use of percast wall and floor components with the wall components being provided with vertical voids that are in registry with the spacing between adjacent horizontal floor sections which are, in turn, supported on said wall sections in spanning relationship thereto. The floor components are precast prior to delivery to the site so that upon in situ pouring of the floor slabs to proper thickness, the cement being used is forced into the voids of the wall panels to effectuate a concrete fusion between wall and floor components.

3,662,507

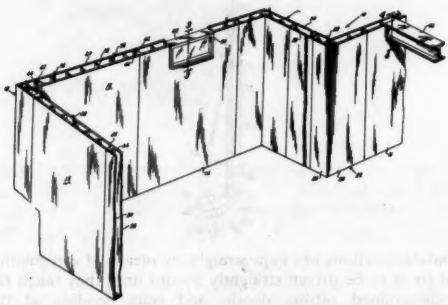
PREFORMED BUILDING WALL CONSTRUCTION

Arthur J. Espeland, Jewell, Iowa

Filed Mar. 11, 1970, Ser. No. 18,493
Int. Cl. E04b *2/32*
U.S. Cl. 52—270 6 Claims

A building wall construction having preformed panels preferably of plastic material for use particularly as basement

walls and also as room walls above the basement level. The panels are keyed to each other and to supporting structures and secured by a suitable bonding agent. There are special panel sections with preformed window units and also



preformed support areas for heavy beams. There is a selection of preformed corners to accommodate varying situations. The panels include preset bolts for the base plates and in one embodiment are provided on their exterior side with preformed brick ledges to support brick facing.

3,662,508

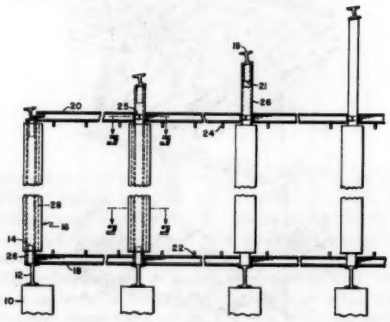
MODULAR BUILDING

James D. Slayden, Nashville, Tenn., assignor to Avco Corporation, Nashville, Tenn.

Filed Oct. 5, 1970, Ser. No. 77,904

Int. Cl. E04b *1/54*

U.S. Cl. 52—393 **13 Claims**



A modular building is constructed of premanufactured panels interlocked by means of integral latching devices on a system of specially constructed columns and beams. The modular building is fireproof and rigid. A minimum number of non-integral fastening devices is needed.

3,662,509

INSULATED ROOF STRUCTURE

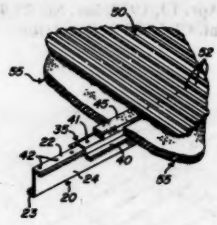
James D. Studzinski, Dayton, Ohio, assignor to Illini Building Systems, Inc., Dayton, Ohio

Original application Feb. 3, 1969, Ser. No. 796,038, now abandoned. Divided and this application Mar. 23, 1970, Ser. No. 21,781

Int. Cl. E04b *1/74*; E04f *15/18*

U.S. Cl. 52—404 **1 Claim**

A roof structure includes a plurality of parallel spaced elongated purlins, and metal roof panels are secured to the upper surfaces of the purlins. Elastically flexible insulation panels are installed after the roof panels are secured to the purlins and are supported adjacent the underneath surfaces of the roof panels by longitudinally extending cap members mounted on the purlins. The insulation panels may also be



supported by insulation strips positioned adjacent the sides of the purlins.

3,662,510

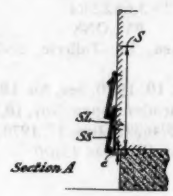
METHOD AND ARTICLE FOR INSTALLING ALUMINUM SIDING

Robert Leddy, 389 Mayer Court, Ridgefield, N.J.

Continuation-in-part of application Ser. No. 875,031, Nov. 10, 1969, now abandoned. This application Aug. 28, 1970, Ser. No. 67,929

Int. Cl. E04f *13/12*

U.S. Cl. 52—748 **2 Claims**



This disclosure relates to a method and article for installing exterior siding on an existing structure in a manner ensuring a substantially perfectly aligned siding job regardless of the lack of true levelness of the existing sheathing on the structure. The method is predicated on the use of a starter strip having a body portion greater than three inches and up to about 6 inches in width with a flange at the lower end thereof extending perpendicularly a distance of about three-eighths inch from the body. The flange terminates in a lock portion for receiving siding panels.

3,662,511

DATA PROCESSING DEVICE FOR A PACKAGING MACHINE

Joseph Eliasberg, The Hague, Netherlands, assignor to Maatschappy Van Berkel's Patent N.V., Rotterdam, Netherlands

Filed Nov. 4, 1970, Ser. No. 86,852

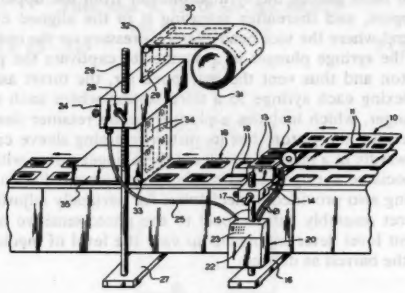
Claims priority, application Germany, Nov. 18, 1969, P 19 57 899.5

Int. Cl. B65b *61/00*, *65/00*

U.S. Cl. 53—14 **6 Claims**

A data processing device for use with a packaging machine, wherein goods are packaged in trays or the like with a cover material having data applied thereto in accordance with weight and price information relating to the goods. The device includes a weighing device onto which goods are placed from a conveyer, a calculator having programmed price information, and the weight information of the goods from the weighing device, and a print-out unit receiving data from the computer and applying it to the cover material so that that part of the cover material with the

data for the tray having goods weighed which produces the data will have the cover applied to the corresponding tray of goods. A tray conveyer is provided for advancing trays in



equally spaced relation along a horizontal path, while a web of material in which the covers for the trays are produced is fed to the trays on a tray conveyer.

3,662,512

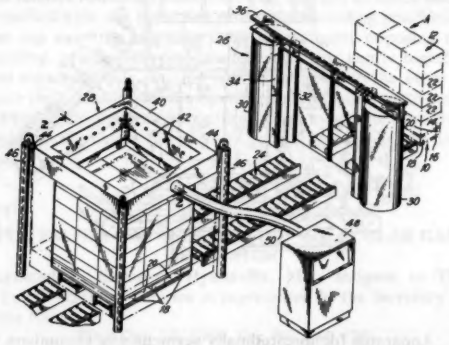
METHOD AND APPARATUS FOR SHRINK-FILM WRAPPING A PALLET LOAD

Seymour Zelnick, Orange, N.J., assignor to Weldotron Corporation, Newark, N.J.

Filed Jan. 24, 1968, Ser. No. 700,116

Int. Cl. B65b *53/06, 61/10*

U.S. Cl. 53—30 **7 Claims**



A pallet-load of product is secured onto a pallet by forming a sleeve of heat shrinkable film around the pallet-load with its open top extending above the pallet-load and its open bottom extending below the pallet. The bottom and the top portions of the sleeve are initially shrunk to lock the sleeve onto the pallet-load and the pallet, and subsequently the intermediate portion of the sleeve is shrunk to unitize the assembly.

3,662,513

METHOD AND APPARATUS FOR WRAPPING ARTICLES IN STRETCHABLE SHEET MATERIAL

Ermanno Fabbri, Vignola, Italy, assignor to Waldyssa S.A., Lugano, Switzerland

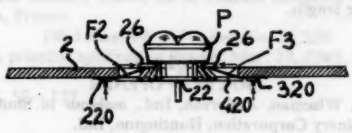
Filed May 13, 1970, Ser. No. 36,730

Claims priority, application Italy, May 20, 1969, 7045 A/69; 12560 A/70

Int. Cl. B65b *11/54, 41/12, 49/08*

U.S. Cl. 53—33 **22 Claims**

A packaging machine for packaging items in stretchable foils of soft plastic material comprises a horizontal plate having an opening through which the items may pass, a mechanism for severing required lengths from a continuous foil web and placing a foil length below the said opening, a gripping device for holding opposed edges of the foil in a final position, a lifting table for pushing an item to be



packaged upwards through the opening, a folding mechanism above the plate for folding the foil sheet edges under the item and a conveying device above the plate for pushing the packaged item off the plate.

3,662,514

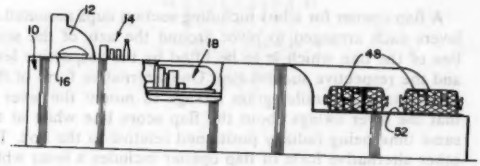
PACKAGING SYSTEM

Donald D. Goss, Marblehead, Mass., assignor to Ideation, Inc., Marblehead, Mass.

Filed Sept. 15, 1969, Ser. No. 857,721

Int. Cl. B65b *5/06, 9/10*

U.S. Cl. 53—37 **11 Claims**



An improved checkout system for articles is provided, e.g. at a supermarket wherein the cashier directs the checked articles to a shuttle, which when filled conveys the articles to a packaging stage, e.g. a tubular net which is sealed at one or both ends forming a package.

3,662,515

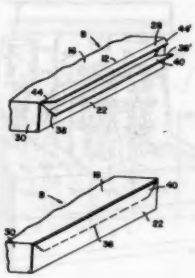
PROCESS FOR SEALING A TOP-OPENING CARTON

Robert O. Stuberg, 101 Bella Vista Drive, Hillsborough, Calif.

Filed May 13, 1970, Ser. No. 36,735

Int. Cl. B65b *7/22*

U.S. Cl. 53—39 **9 Claims**



A process for closing a top-opening carton by providing flaps corresponding in shape to a movable segment of the wall panel to which it is to be attached. Each such flap is tucked inside the corresponding movable segment of the wall panel and caused to adhere to the inside of the movable wall segment by the use of hot or cold adhesive or by heat sealing (softening and mating of thermoplastic coatings on the surface of the paperboard). The resiliency of paperboard proxi-

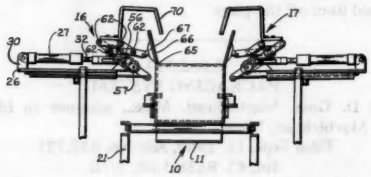
mate to score lines and its tendency, when bent along a score line, to return to its original flap plane, provides sufficient back pressure in the flap to force it into intimate contact with the inner face of the movable segment of the wall panel resulting in effective bonding of the flap to the segment along its entire length.

3,662,516

BOX FLAP OPENER

John A. Wiseman, Anderson, Ind., assignor to Shuttleworth Machinery Corporation, Huntington, Ind.

Filed Mar. 17, 1970, Ser. No. 20,270
Int. Cl. B65b *43/39*
U.S. Cl. 53—76 **10 Claims**



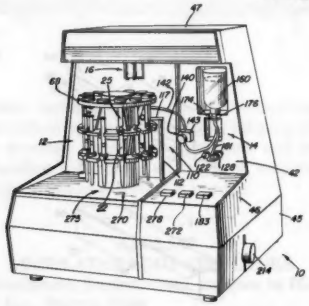
A flap opener for a box including suction cups mounted on levers each arranged to pivot around the axis of the score line of the flap which is to be lifted by the respective lever and the respective suction cup. One alternative form of flap opener uses a parallelogram linkage to mount the lever so that the lever swings about the flap score line while at the same time being radially positioned relative to the box. The other alternative form of flap opener includes a lever which is positioned on one side of the box and, after the flap is opened, the box is pushed away from the lever by a hydraulic cylinder. Both alternative forms include means for holding the flap open after it has been opened.

3,662,517

SYRINGE FILLING APPARATUS

Edward R. Tascher, Manchester, and Elmer A. Koenig, Kirkwood, both of Mo., assignors to Sherwood Medical Industries Inc.

Filed Apr. 8, 1970, Ser. No. 26,683
Int. Cl. B65b *7/28, 3/04, 23/22*
U.S. Cl. 53—282 **9 Claims**



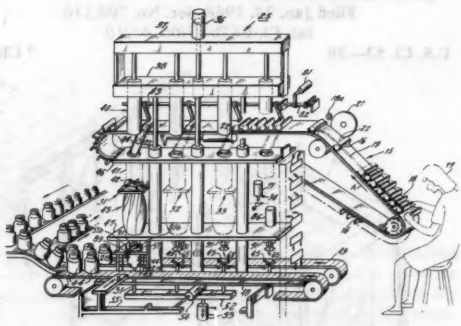
A syringe filling apparatus for automatically filling a plurality of syringes serially including an indexable turret having a lower support for holding a plurality of open syringe barrels and an upper support for holding a corresponding plurality of syringe plungers in aligned position with respect to the cylinder barrels, the turret assembly indexing each syringe to a filling station where medicament is dispensed into an open cylinder barrel and the medicament level in the barrel is sensed by a photo-sensitive circuit and medicament flow controlled in response thereto, the turret assembly indexing each syringe to a second station where a vertically reciprocable tool head pushes the syringe plunger from the upper turret support, and thereafter releasing it in the aligned cylinder barrel where the tool head exerts a pressure on the outer ring of the syringe plunger in a manner to captivate the plunger piston and thus vent the entrapped air, the turret assembly indexing each syringe to a third station where each syringe plunger, which includes a plunger piston retainer sleeve for releasing the piston, has its piston releasing sleeve cammed upwardly in a manner to release the plunger piston within the associated syringe barrel sealing medicament therein, there being also provided a mechanism for vertically adjusting the turret assembly with respect to the photo-sensitive medicament level detecting means to vary the level of medicament in the barrels as desired.

3,662,518

SPEAR PACKING APPARATUS

Bernard C. Eisenberg, Rockaway, N.J., assignor to Solbern Corp., Fairfield, N.J.

Filed Oct. 26, 1970, Ser. No. 83,868
Int. Cl. B65b *63/00*
U.S. Cl. 53—123 **10 Claims**



Apparatus for longitudinally segmentizing cucumbers and packing the segments in a jar with the seeded surfaces of the segments facing outward is constructed with means for receiving a whole cucumber and cutting same to predetermined length. The predetermined length of cucumber is slit longitudinally into spears of segmental cross section that are fed through individual twisted chutes and exit therefrom into a jar with the seeded surfaces of the segments facing outward. Guide means at the exit ends of the twisted chutes directs the segments outward toward the jar wall. Thereafter the guide means and the jar are angularly stepped so that additional spear segments entering the jar are directed between those segments previously placed in the jar.

In one embodiment of this invention, after the jar wall is lined with spear segments the guide means is withdrawn from the jar and additional spears are placed in the central region of the jar by hand.

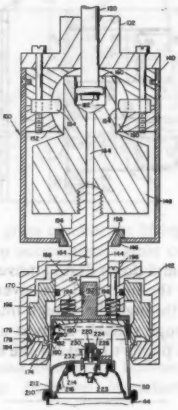
In another embodiment of this invention, the guide means is selectively operated to a collapsed and an expanded condition. The jar wall is lined with spears while the guide means is expanded, and after the jar wall is lined with spear segments the guide means is collapsed and additional spear segments entering the jar remain at the central region to fill the jar without interfering with the spear segments lining the jar wall.

3,662,519

APPARATUS FOR MOUNTING CAPS

Edward J. Adams, St. Paul, Minn., assignor to The Gillette Company, Boston, Mass.

Filed Sept. 2, 1970, Ser. No. 68,825
Int. Cl. B65b 7/28
U.S. Cl. 53—329 7 Claims



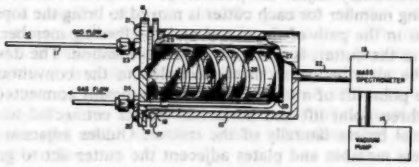
A cap is mounted on a dispensing container having an upwardly extending valve actuator, the cap having an aperture through which the actuator is arranged to extend, the actuator and the cap opening having mating configurations fixing the relative rotational positions of the cap and actuator about a vertical axis; the mounting procedure including positioning the cap over the container with the actuator opposing the opening, pressing the cap and the actuator gently together and simultaneously rotating one with respect to the other to mate the actuator with the opening and to cause one to enter the other, the pressure being insufficient to actuate the valve, and then increasing the pressure to seat the cap on the container.

3,662,520

SYSTEM FOR GAS ANALYSIS AND MOLECULAR GAS SEPARATOR

Raymond A. Saunders, Hyattsville, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 24, 1969, Ser. No. 869,128
Int. Cl. B01d 15/08
U.S. Cl. 55—158 5 Claims



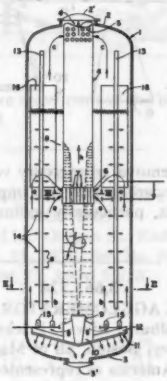
A system for gas analysis including an open tubular gas chromatographic column coupled to a gas analyzer through a diffusion type molecular gas separator and gas flow channeling which extends from the exit of the chromatographic column through the molecular gas separator and has the same or nearly the same cross section for gas flow as the chromatographic column. In this system, carrier gas is separated from the organic components to give component-enriched gas samples for delivery to the gas analyzer and without loss of the fine separation of the organic components effected in the chromatographic column.

3,662,521

DEVICE FOR REACTION BETWEEN LIQUID PHASE AND GASEOUS PHASE

Meyer Behar, Lyon; Jean-Pierre Dal Pont, Decines, and Jerome Montet, Senlis, all of France, assignors to Progil, Paris, France

Filed Mar. 27, 1970, Ser. No. 23,238
Claims priority, application France, Mar. 27, 1969, 6908385
Int. Cl. B01f 3/04
U.S. Cl. 55—237 5 Claims



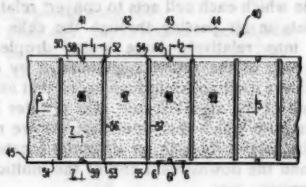
A reactor for reaction between liquid phase and gaseous phase reactants which contains a coaxial chimney within the reactor which has a distributor located intermediate its length and has a quieting device attached to its lower end.

3,662,522

GETTER PUMP CARTRIDGE

Paolo Della Porta, and Bruno Ferrario, both of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed July 15, 1970, Ser. No. 55,029
Claims priority, application Italy, July 24, 1969, 869075
Int. Cl. B01d 53/04; F04b 37/02
U.S. Cl. 55—387 5 Claims

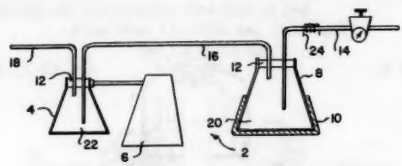


A cartridge for a getter pump having a pleated strip comprising a substrate having a non-evaporable getter metal thereon. Adjacent surfaces of the pleated strip are held at a predetermined angle by a spacer between the adjacent surfaces. Getter pumps employing such cartridges exhibit maximum pumping rates. Strips suitable to be pleated are also described.

3,662,523
ADSORBENTS FOR REMOVAL OF MERCURY VAPOR FROM AIR OR GAS

William H. Revoir, West Hartford, Conn., and John A. Jones, Springfield, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 15, 1970, Ser. No. 98,318
Int. Cl. B01d *53/04*; B01j *11/78*
U.S. Cl. 55—387 2 Claims

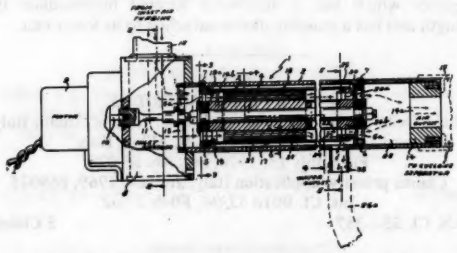


Adsorbents for removal of mercury vapor from air or gas including activated carbon granules impregnated with interhalogen compounds, particularly iodine monochloride and iodine trichloride.

3,662,524
CENTRIFUGE AGGLOMERATOR - SEPARATOR

Adi R. Guzdar, Sudbury; Alve J. Erickson, Cambridge, and Andrew C. Harvey, Boston, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Apr. 21, 1970, Ser. No. 30,425
Int. Cl. B01d *45/00*, *46/18*, *46/30*
U.S. Cl. 55—400 3 Claims



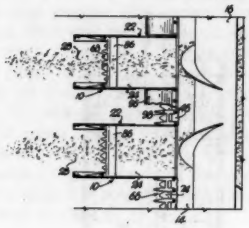
A centrifuge agglomerator water particle separator which comprises a motor driven elongated multicellular rotary agglomerator in which each cell acts to convert relatively small water droplets in air passing through the cells in the agglomerator into relatively large water droplets in the downstream end of the rotary agglomerator by centrifugal action, which are discharged through holes, that are provided in the aft end of the agglomerator, into a water bleed line, while the air from which the water droplets are removed is separately discharged through an air outlet located concentrically beyond the downstream end of the multicellular rotary agglomerator.

3,662,525
SOYBEAN HARVESTING APPARATUS

Allen A. White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed May 4, 1970, Ser. No. 34,297
Int. Cl. A01d *41/00*
U.S. Cl. 56—2 12 Claims

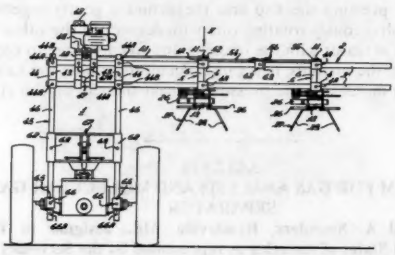
A soybean harvesting unit, adapted for attachment to the cutter bar of a combine header forwardly of its pan and beneath its reel, includes a forwardly and downwardly inclined, open-top trough pivotally supported for vertical flotation, an oscillatory cutter at the crop-receiving inlet of the trough, and a double joint coupling between the cutter and the knife sections of the reciprocable combine sickle to drive the cutter up and down during movement of the trough. As the plants enter the inlet and are severed, the reel sweeps the severed plants through the trough into the pan while the sidewalls of the trough slidably support and guide overhanging branches of the plants to prevent the latter from falling to the ground.



3,662,526
DEVICES FOR TOPPING TOBACCO PLANTS

Elwood Lee Smith, Elm City, N.C., assignor to The Lely Corporation, Elm City, N.C.

Filed Apr. 14, 1970, Ser. No. 28,407
Int. Cl. A01d *45/02*
U.S. Cl. 56—63 14 Claims



A transportable device for topping plants includes a frame with at least one cutter on a support mounted laterally of the frame. The frame has portions for adjusting the height of the cutter and the cutter support can be moved along the frame to horizontally adjust the position of the cutter. An endless feeding member for each cutter is moved to bring the tops of plants in the path of the cutter and the feeding member, as well as the cutter, is moved by belt transmission. The device can be an attachment that is coupled to the conventional three point lift of a tractor with vertical beams connected to the three point lift and horizontal beams connected to the vertical beams laterally of the tractor. Guides adjacent the endless member and plates adjacent the cutter act to guide the plants and their cuttings as the device is moved along rows of plants.

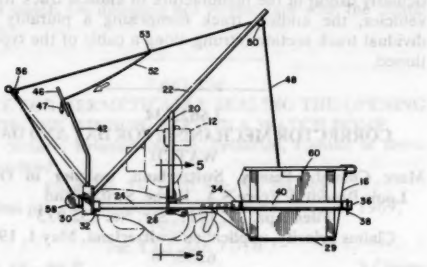
3,662,527
GRASS CATCHER

Wilbur T. Breckenridge, Jr., 2677 Brookmead Lane, La Jolla, Calif.

Filed June 11, 1970, Ser. No. 45,479
Int. Cl. A01d *53/06*
U.S. Cl. 56—200 11 Claims

A grass catcher that is supported on the front of a lawn mower, such as a reel type lawn mower, for upward pivotal

movement in a direction normal to the path of movement of the mower, and a lifting arrangement operable from a position spaced from the grass catcher for lifting and pivoting the grass catcher to dump accumulated grass cuttings to the side of the mower and out of the path of movement of the mower.

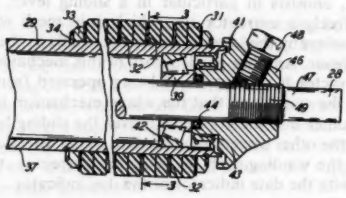


3,662,528

ROLLER FOR REEL TYPE LAWN MOWERS

Sahag C. Akgulian, and Donald G. Haffner, both of Racine, Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.

Filed June 10, 1970, Ser. No. 44,919
Int. Cl. A01d *55/20*
U.S. Cl. 56—249 **7 Claims**



A roller for a lawn mower of the reel type, and with the roller extending for the length of the reel and across the width of the mower. The roller is rotatably mounted, and it has large diameter portions on opposite ends, and it has a small diameter portion in the middle of the length of the roller. The end large portions engage the ground and support the mower at the spaced-apart locations of the large portions, and the smaller diameter middle portion of the roller presents an anti-scalping member for the mower. The roller includes a base tube or cylinder, and rotation bearings fit within the ends of the tube for rotatably supporting the roller on the mower. The large diameter portion is shown to be a plurality of rubber rings which are pressed onto the ends of the tube and which therefore rotate with the tube, as one rotatable roller.

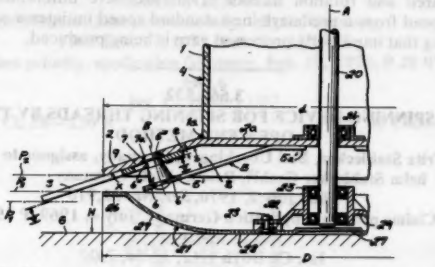
3,662,529

SWINGING BLADE ARRANGEMENT FOR MOWER ASSEMBLY

Josef Glunk, and Heinz Gnadler, both of Gottmadingen, Germany, assignors to Maschinenfabrik Fahr AG, Gottmadingen, Germany

Filed Oct. 30, 1970, Ser. No. 85,504
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **10 Claims**

A mower assembly of the type in which a cylindrical mower body is rotated about a vertical axis and has a downwardly and outwardly divergent frustoconical apron or plate. The plate is provided with leaf-spring mounts for the blades whereby relative movement of the blades and the support plate is permitted.

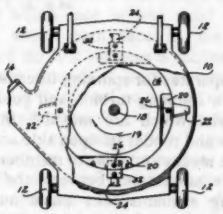


3,662,530

RAKING AND MULCHING MEANS FOR ROTARY MOWERS

Harold C. Henriksen, 1133 Oregon St., Racine, Wis.

Filed Dec. 15, 1970, Ser. No. 98,424
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **4 Claims**



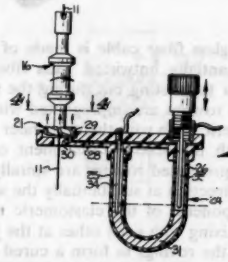
A raking and mulching means to be combined with the rotating member of a rotary mower so as to permit raking and mulching of leaves and other matter while also cutting the grass. If desired, this means can be substituted for all of the cutting blades when merely mulching or pulverizing. (Mulching is to be interpreted as being the reducing of leaves grass and such matter to small particles).

3,662,531

METHOD AND APPARATUS FOR PROTECTING PRODUCTION OF TEXTURED TEXTILE YARN

Patrick P. Carroll, Shannon, Ireland, assignor to Jonathan Logan, Inc., Spartanburg, S.C.

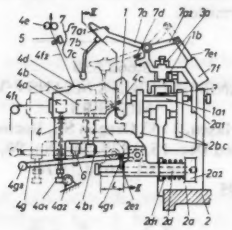
Filed Apr. 21, 1970, Ser. No. 30,382
Int. Cl. D02g *1/02;* **D01h** *1/26, 7/92*
U.S. Cl. 57—34 HS **22 Claims**



Continued production of improperly processed textile yarn otherwise resulting from rotation of a spindle at an improper

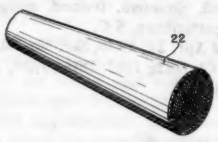
speed is protected against by a method and apparatus in which the rotational speed of the spindle is continually monitored and rotation thereof at an excessive differential in speed from a predetermined standard speed initiates a warning that improperly processed yarn is being produced.

3,662,532
SPINNING DEVICE FOR SPINNING THREADS BY THE OPEN-END METHOD
Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Wilhelm Stahlecker GmbH, Reichenbach, Germany
Filed July 2, 1970, Ser. No. 51,910
Claims priority, application Germany, July 4, 1969, P 19 33 930.1
Int. Cl. D01h *1/12, 13/14, 7/00*
U.S. Cl. 57—58.89 **22 Claims**



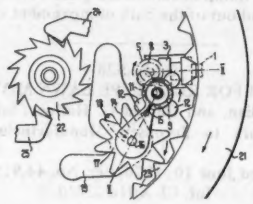
A spinning apparatus for spinning threads by the open-end method having a spinning turbine and guiding elements for the fiber material which are movable in relation to the spinning turbine and render its open side accessible from the outside. Release means and control members are provided so that the relative movements between the spinning turbine and the guiding elements take place automatically. The release means is actuated to open the spinning turbine by thread break detectors or thread sensing devices.

3,662,533
GLASS FIBER CABLE
Donald L. Snellman, and Willard G. Hudson, both of Seattle, Wash., assignors to Norfin, Inc., Seattle, Wash.
Filed Jan. 5, 1970, Ser. No. 718
Int. Cl. D07b *1/16, 1/00, 3/02*
U.S. Cl. 57—140 G **4 Claims**



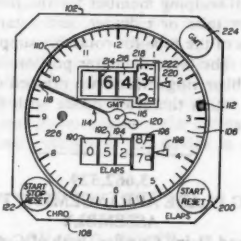
A coreless glass fiber cable is made of a plurality of individual substantially untwisted glass fiber rovings twisted together. Prior to twisting but during the twisting operation certain of the rovings are impregnated with one component of an elastomeric resin with the remainder of the rovings impregnated with the second component of the elastomeric resin. The impregnated rovings are spirally twisted together in the same direction at substantially the same helical angle, the two components of the elastomeric resin impregnating the rovings mixing with each other at the junction of the intertwining of the rovings to form a cured elastomer spacing the glass fiber rovings and filaments making up the rovings from each other. The layed up glass fiber cable is fed back on itself and subsequent layers of impregnated rovings plied together over the initial layers. The subsequently applied layers are applied at the same helical angle as the initial layer. The cable, although useful for other purposes, is particularly useful in the manufacture of endless track for track vehicles, the endless track comprising a plurality of individual track sections strung along a cable of the type mentioned.

3,662,534
CORRECTOR MECHANISM FOR DAY AND DATE WATCH
Marc Colomb, Peseux, Switzerland, assignor to OMEGA Louis Brandt & Frere S.A., Berne, Switzerland
Filed Apr. 21, 1971, Ser. No. 132,973
Claims priority, application Switzerland, May 1, 1970, 6585/70
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **6 Claims**



This invention relates to a corrector mechanism for day and date watches. This mechanism, object of the present invention, consists in particular in a sliding lever, on which pivots freely a corrector star which is in mesh with a corrector, whereby the latter is located coaxially to the aforesaid sliding lever. Another particularity of this mechanism is, that the corrector is susceptible of being operated from the outside of the watch and that the whole mechanism is disposed in a manner that the corrector moves the sliding lever in the one or the other direction, according to the direction of rotation of the winding-shaft, to bring the corrector star in gear either with the date indicator or the day indicator.

3,662,535
AIRCRAFT TIME INDICATOR
Geoffrey S. Hedrick, Bedford Hills, N.Y.; Frank H. Hawkins, Bennebroek, and William Van Os, Badhoevedorp, both of Netherlands, assignors to Lear Siegler, Inc., Armonk, N.Y.
Filed July 10, 1969, Ser. No. 840,729
Int. Cl. G04f *3/06*
U.S. Cl. 58—39.5 **5 Claims**



A clock and two elapsed time meters are incorporated in the same instrument and driven from a common electronic time base oscillator. The time of day is indicated by a set of digital read-out drums located above the center of a circular dial, while long term cumulative elapsed time is indicated by another digital drum read-out located below the center of the

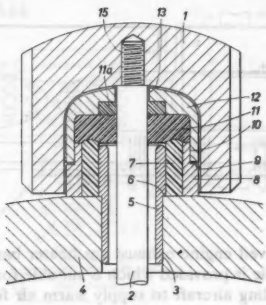
dial. At the periphery of the dial is a circular scale representing short term cumulative elapsed time, which is swept by a peripheral minute indicator as well as a sweep second hand, both of which are designed not to interfere with the digital displays.

3,662,536

DEVICE FOR HERMETICALLY SEALING THE OPENING FOR THE WINDING STEM IN A WATCH DOME

Walter Stebler, Konzumweg 10, Preterlen, Conton of Bern, Switzerland

Filed Dec. 21, 1970, Ser. No. 99,992
Claims priority, application Switzerland, Dec. 23, 1969, 19120/69
Int. Cl. G04b *37/10*
U.S. Cl. 58—90 B 3 Claims



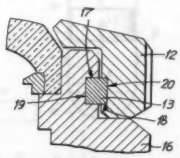
A device for hermetically sealing the opening in a watch dome for a winding stem characterized by a hollow crown provided at one end of the winding stem, this crown having a circularly-shaped wall extending around a fixed projecting part of the device, wherein the fixed part comprises at least one sealing ring, a support element and a cap which overlaps the ring, the cap being supported on a fixed base with a press fit so that the sealing ring is pressed against the support element in an axial direction.

3,662,537

CONSTRUCTION OF ROTATING BEZEL SECTION FOR WATCH CASES

Yoshiaki Fujimori, Suwa-shi, Japan, assignor to Kabushiki Kaisha Suwa Sukosha

Filed Dec. 8, 1969, Ser. No. 883,049
Claims priority, application Japan, Dec. 10, 1968, 43/90069
Int. Cl. G04b *39/00*
U.S. Cl. 58—91 3 Claims



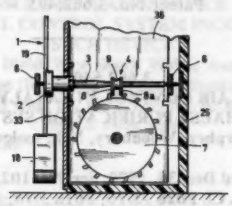
A bezel is sealed to a watch-case by the use of packing seated in annular grooves in the case band and in the bezel. The depths of the grooves and pressures against the packing are such that accidental disengagement of the bezel from the watch case is prevented and a water-tight seal is provided, although the bezel can rotate smoothly around the case band. The depth of the case band groove is greater than that of the bezel groove so that the packing is retained in the case band during intentional removal of the bezel.

3,662,538

DEVICE FOR MEASURING REPETITIVE IDENTICAL TIME INTERVALS

Rudolf Wittner, Johnstrasse 6, Isny, Allgau, Germany

Filed Feb. 17, 1971, Ser. No. 115,988
Claims priority, application Germany, Feb. 19, 1970, P 20 07 680.6
Int. Cl. G04f *11/02*
U.S. Cl. 58—130 R 35 Claims



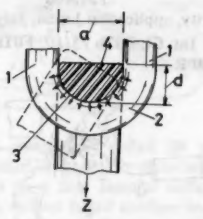
A shaft is journalled in a housing for turning movement about an axis; the shaft has a first portion and a second portion. A pendulum is fast with the first portion elongated radially of the axis for swinging movement about the same and a pair of anchor plates are mounted on the second portion axially spaced in parallel planes. The blades each have a first surface both of which face in one axial direction and a second surface which both face in the opposite axial direction. Each of the first surfaces is inclined to and has an edge portion which extends at least substantially radially of the axis and is convexly curved on a small radius in direction axially of the shaft towards the respectively associated second surface. A circumferentially toothed wheel is mounted and biased for rotation in a plane at least substantially normal to the planes of the anchor plates and parallels the axis so that consecutive teeth of the wheel engage first one of the first surfaces to slide along the same to and over the edge portion past the associated second surface while concomitantly imparting to the plates and thereby to the pendulum a swinging pulse and to subsequently abut against the other of the first surfaces where it again slides past the edge portion and second surface while the next-following tooth engages the first-mentioned first surface.

3,662,539

INJECTION MOULDED CHAIN, ESPECIALLY PLASTIC CHAIN

Peter Florjancic, St. Mortinstrobe 12, 81 Garmisch-Partenkirchen, Germany

Filed Oct. 14, 1969, Ser. No. 866,186
Claims priority, application Australia, Oct. 16, 1968, A 10093/68
Int. Cl. F16g *13/06*
U.S. Cl. 59—80 6 Claims



A chain or the like is formed by injection moulding of a first link into a second link, one of the links having a non-circular cross-section, which cross-section is preferably substan-

tially defined by a semi-circle and a straight line or a polygon, and has an extent perpendicular to the plane of the link which is at least approximately equal to the spacing between the side portions of the other link and a smaller extent in the plane of the link.

ERRATUM

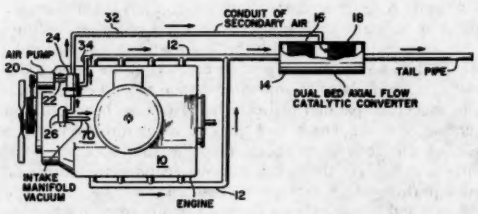
For Class 60—19 see:
Patent No. 3,662,495

3,662,540

SECONDARY AIR CONTROL IN CATALYTIC VEHICLE EXHAUST PURIFICATION SYSTEM

Richard C. Murphey, Woodbury, N.J., assignor to Mobil Oil Corporation

Filed Dec. 30, 1970, Ser. No. 102,591
Int. Cl. F02b *75/10;* **F01n** *3/14, 3/16*
U.S. Cl. 60—30 R **15 Claims**



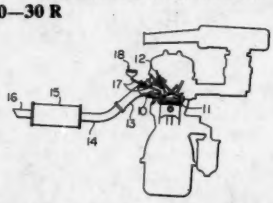
Control of secondary air flow to a dual bed catalytic converter is provided by sensing engine temperature at a location remote from the converter and applying a control function in response thereto to switch air flow between the first and second catalytic beds of the converter. During warm-up secondary air input is directed to the first catalyst bed, but is switched to the second catalyst bed when the temperature in the flow path between the beds reaches about 1,000° F. Engine temperature at a point remote from the beds, e.g. engine coolant temperature, is correlated to the temperature at the outlet of the first catalyst bed thereby enabling sensing of a significantly lower temperature level to control switching of air input to the catalyst beds. A secondary air control valve is operated by application thereto of the engine intake manifold pressure in response to sensed coolant temperature to switch secondary air input between the beds.

3,662,541

ENGINE EXHAUST GAS OXIDIZING SYSTEM

Hiraki Sawada, No. 2068-112, 3 chome, Tujimi-cho, Higashimuayama, Tokyo, and Kenji Masaki, No. 640, 4-chome, Sekimachi, Nerima-ku, Tokyo, both of Japan

Continuation of application Ser. No. 823,553, May 12, 1969, now abandoned. This application Mar. 15, 1971, Ser. No. 124,466
Claims priority, application Japan, July 10, 1968, 43/48243
Int. Cl. F02b *75/10;* **F01n** *3/10*
U.S. Cl. 60—30 R **9 Claims**



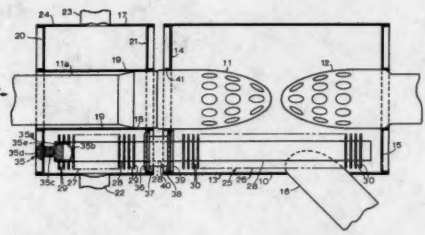
A system for converting the unburned or partially burned toxic compounds of the exhaust emission from an automotive gasoline-powered engine into harmless gases through re-oxidization of the emission in the exhaust system. An appropriate amount of fresh air is delivered to the exhaust system in close response to the pulsation of the exhaust pressure so that the mixture of the exhaust emission and air is after-burned satisfactorily under the varying conditions of the engine operation.

3,662,542

ENGINE EXHAUST GAS HEATER

Alan J. Streb, Baltimore, Md., assignor to Dynatherm Corporation, Cockeysville, Md.

Filed Sept. 3, 1969, Ser. No. 854,923
Int. Cl. B60h *1/20*
U.S. Cl. 60—31 **8 Claims**



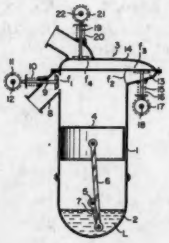
An improved engine exhaust gas heater based on the heat pipe principle is provided which is suitable for many applications, including aircraft to supply warm air for cabin conditioning, and also automobiles, trucks, and other vehicles. The heater is preferably associated with the engine exhaust gas muffler, and the resulting combination comprises a device or system of greater safety and of increased effectiveness regarding heat transfer and noise reduction capability.

3,662,543

HEAT ENGINE AND A METHOD OF PUTTING THIS ENGINE INTO ACTION

Milorad Milisavljevic, Promenade des Anglois 181, F-06-Nice, France

Filed Dec. 14, 1970, Ser. No. 97,515
Claims priority, application Switzerland, Dec. 17, 1969, 018913/69
Int. Cl. F02c *5/00*
U.S. Cl. 60—39.6 **2 Claims**



In an otherwise conventionally designed piston and cylinder internal combustion engine, is provided an additional, fixed volume, combustion chamber, which can communicate with the variable volume enclosure provided by the piston and cylinder. The engine operates on a six-stroke cycle. During the first stroke, air is drawn into the enclosure; during the second, the air is compressed and introduced into the chamber; during the third, the chamber is sealed off, more air is drawn into the enclosure, fuel is injected into the chamber and the resultant mixture in the chamber is ignited; during the fourth, the air in the enclosure is compressed

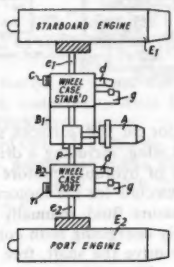
while combustion still carries on in the chamber; during the fifth, the chamber is made to communicate with the enclosure to bring the burning mixture into contact with the compressed air thereby to complete combustion and to drive the piston; and during the sixth, the burnt gases are exhausted. The working stroke is thus the fifth.

3,662,544

COMBINED AUXILIARY POWER AND ENGINE STARTER SYSTEMS

Peter Burno Kahn, and Norman Frederick North, both of Fareham, England, assignors to The Plessey Company Limited, Essex, England

Filed May 15, 1970, Ser. No. 37,687
Claims priority, application Great Britain, May 19, 1969, 25,490/69
Int. Cl. F02c 7/26
U.S. Cl. 60—39.14 **4 Claims**



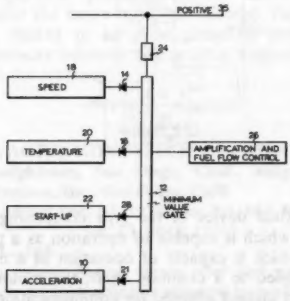
To permit an auxiliary power unit to start an engine without drastic temporary reduction of the running speed of that unit, the engine is coupled to the auxiliary power unit by a differential gear drive whose third element drives a gear pump having in that outlet which is the delivery outlet when the auxiliary power unit drives the engine, a normally unloaded pressure retaining valve which, to produce starting torque for the engine, can be loaded to build-up a preset delivery pressure. A pre-loaded pressure-retaining valve may be provided in the other pump outlet in order to permit transmission of torque from the main engine to the auxiliary power unit, both valves being by-passed in the respectively reverse direction by non-return valves.

3,662,545

ACCELERATION CONTROL CIRCUIT FOR A GAS TURBINE

Richard K. Davis, Roanoke, Va., assignor to General Electric Company

Filed Aug. 24, 1970, Ser. No. 66,268
Int. Cl. F02c 9/08
U.S. Cl. 60—39.28 **8 Claims**



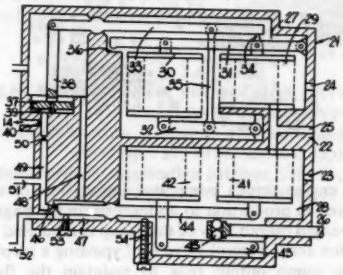
An electrical control circuit for adjusting the fuel input to rotating machinery such as a gas turbine during acceleration, includes a positive speed feedback signal in opposition to a reference signal representing maximum allowable acceleration. A third input signal, applied to the input of the control circuit in equal opposition to the speed reference signal when the acceleration of the turbine is zero, prevents a time delay from occurring in control reaction to changes in speed of the turbine.

3,662,546

FLUID PRESSURE ACTUATED DEVICE AND A GAS TURBINE FUEL CONTROL SYSTEM INCORPORATING SUCH DEVICE

Richard Joseph Ifield, New South Wales, Australia, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Aug. 19, 1970, Ser. No. 65,008
Int. Cl. F02c 9/08
U.S. Cl. 60—39.28 **12 Claims**



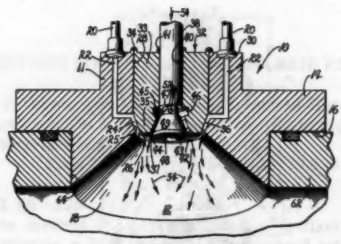
A fuel control system for a gas turbine engine has a metering valve positioned by a control fluid pressure from a device actuated by fuel pressure in response to air pressure signals obtained from the engine compressor. These pressure signals are applied to bellows units which operate through linkages to vary the effective areas of flow restrictions and thereby to provide variations in the control pressure.

3,662,547

COAXIAL INJECTOR FOR REACTION MOTORS

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to, and Larry L. Larson, 11010 Irma Avenue, Tujunga, Calif.

Filed Mar. 16, 1970, Ser. No. 19,585
Int. Cl. F02k 9/02; B05b 7/00
U.S. Cl. 60—39.74 A **4 Claims**



A coaxial injector particularly suited for use in mixing liquid propellants within combustion chambers of reaction motors, characterized by a first annular orifice, of a fixed dimension, adapted to deliver liquid oxidizer in an outwardly diverging conical sheet circumscribed by a second annular orifice, also of a fixed dimension, adapted to deliver an outwardly converging conical sheet of liquid fuel, whereby the sheets are caused to experience momentum exchange at an annular intersection for thereby developing a homogeneous

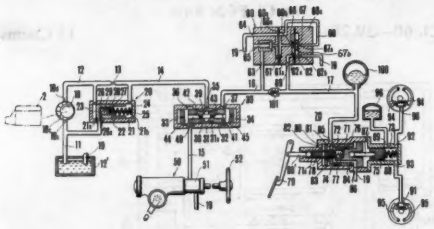
mixture sheathed within a layer of a fuel-rich mixture for cooling the walls of the associated combustion chamber, a feature of the injector being an integration of injector components into an all-welded, unitary structure having empirically established propellant mixing characteristics.

3,662,548

FLUID CONTROL SYSTEM FOR VEHICLES

Akira Suzuki, and Tadataka Narumi, both of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Aichi-Ken, Japan

Filed June 1, 1970, Ser. No. 42,120
Claims priority, application Japan, June 5, 1969, 44/44189
Int. Cl. F15b *1/02*
U.S. Cl. 60—51 **3 Claims**



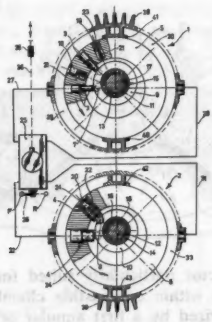
In a vehicle engine driven pump the output flow of the pump is increased in proportion to an increase in the engine speed. The increased output flow of the pump is regulated by a metering orifice and a control valve for bypassing a surplus quantity of the pump output flow to maintain the fluid volume downstream of the metering orifice at a predetermined constant volume. The constant volume downstream of the metering orifice is divided into two portions by means of a proportional distributing valve, one portion being supplied to a first pressure fluid actuated device through a check valve and the other portion to a second pressure fluid actuated device. An unloading valve and an accumulator are connected to the first pressure fluid actuated device to assure supply of the pressurized fluid under a constant pressure.

3,662,549

POSITIVE DISPLACEMENT MACHINE WITH A CONTINUOUSLY VARIABLE ADJUSTMENT FOR A HYDROSTATIC GEAR

Joachim Wurzer, Theodor Storm Strasse 47, 28 Bremen, Germany

Filed June 22, 1970, Ser. No. 48,006
Int. Cl. F16d *31/02*
U.S. Cl. 60—53 B **5 Claims**



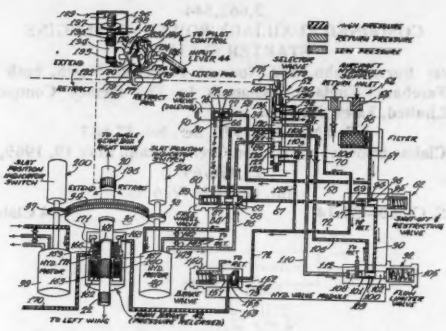
Stepless variable hydrostatic gear comprising a positive displacement pump and motor, at least one of which has means for the adjustment of the displacement volume, causing an alteration in the gear ratio; said means being constituted by wall parts which are movable under hydraulic pressure.

3,662,550

ACTUATOR SYSTEM

Gerhardt E. Lichtfuss, Rockford, Ill., assignor to Sundstrand Corporation

Filed Jan. 11, 1971, Ser. No. 105,272
Int. Cl. F16d *33/00*
U.S. Cl. 60—53 R **17 Claims**



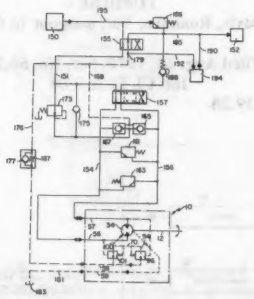
An actuator system for air foil surfaces such as leading edge slats in an aircraft wing, including a drive shaft for actuating the slats, a pair of hydraulic motors for driving the shaft, separate control circuits for the motors supplied from separate sources of pressure fluid, manually operable valve means for simultaneously energizing both control systems to operate both motors to drive the shaft, free wheeling valve means in each circuit enabling either motor to be driven by the shaft in event of pressure failure in its circuit, brake means for the drive shaft, separate brake release devices controlled separately by the two circuits such that either is capable of releasing the brake when the shaft is put in operation, and feedback means driven by the shaft for neutralizing the manual valve means and stopping the drive motors when the required slat adjustment is completed.

3,662,551

FLUID PRESSURE CONTROLLING

James M. Denker, Scituate, Mass., assignor to Nutron Corporation, Hingham, Mass.

Filed Aug. 19, 1970, Ser. No. 65,102
Int. Cl. F16d *31/06;* **F04b** *9/08*
U.S. Cl. 60—53 A **42 Claims**



In a rotary fluid device of the type comprising two elements, one of which is capable of operation as a pump and the other of which is capable of operation as a motor and which are coupled to a common shaft, the motor element having the inlet thereof adapted for communication with the main inlet of the device and the outlet thereof adapted for communication with an intermediate conduit, the pump ele-

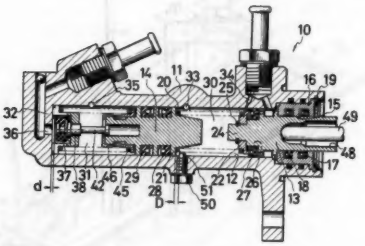
ment having the inlet thereof adapted for communication with the intermediate conduit and the outlet thereof adapted for communication with the main outlet of the device, in a first aspect that improvement comprising ducting extending from the intermediate conduit to a fluid drain and valving within the ducting and responsive to fluid pressure in either the main inlet or the main outlet for maintaining the fluid in the intermediate conduit at a pressure bearing a predetermined relationship to the pressure of fluid in the main inlet or main outlet. In a second aspect, a device having valving and ducting as above described and in which elements are pistons carried by a rotor mounted within a housing and the intermediate conduit is an annular chamber defined by the rotor and housing within which pistons are located during rotation of the rotor. In a third aspect, in which a second chamber surrounds the shaft on which the rotor is mounted, that improvement wherein the annular chamber is maintained at one pressure level and fluid in the second chamber is maintained at a second, significantly lower pressure level.

3,662,552

MASTER CYLINDER FOR HYDRAULIC BRAKING SYSTEM

Chiaki Ochiai, Kariya City, and Takashi Fuji, Toyota City, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya City, Oichi Pref., Japan

Filed Oct. 12, 1970, Ser. No. 79,757
Claims priority, application Japan, Oct. 18, 1969, 44/83507
Int. Cl. F15b *7/00*
U.S. Cl. 60—54.6 E **2 Claims**



A master cylinder for hydraulic braking system of an automotive vehicle comprising a hydraulic piston slidably fitted in the cylinder bore, a valve member operatively connected to the piston and normally spaced from a reservoir inlet of the master cylinder for controlling fluid communication therethrough, a stopper bolt normally spaced from the piston for limiting the most retracted position thereof. When residual hydraulic pressure remains within the master cylinder after the brake has been released, the piston is immediately shifted to its most retracted position due to residual pressure whereby any residual hydraulic pressure is released to the reservoir.

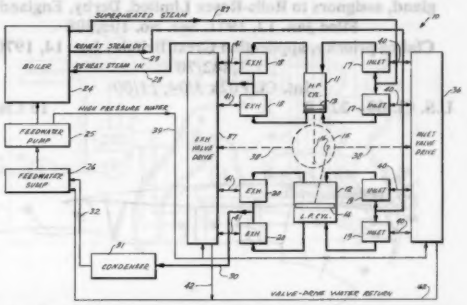
3,662,553

VALVE ACTUATION SYSTEM FOR STEAM ENGINE

Robert Hodgkinson, San Diego, Calif., assignor to Steam Power Systems, Inc., San Diego, Calif.

Filed Dec. 31, 1970, Ser. No. 103,269
Int. Cl. F01k *13/00*
U.S. Cl. 60—105 **16 Claims**

A steam engine having steam inlet and exhaust poppet valves which are hydraulically actuated by water under pressure. Engine-driven rotary distributors couple a boiler feedwater pump or other source of high-pressure water to the valves, and the distributors deliver gated water pulses to actuate the valves in timed sequence. The inlet-valve distributor is adjustable to provide a variable-admission adjustable-cutoff inlet system for steam supplied to the engine cylinders.

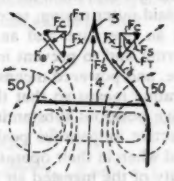


3,662,554

ELECTROMAGNETIC PROPULSION DEVICE FOR USE IN THE FORWARD PART OF A MOVING BODY

Axel De Broqueville, Translaan 478, Sterrebeek, Belgium

Filed Apr. 27, 1970, Ser. No. 32,066
Claims priority, application Belgium, Feb. 19, 1970, 85.403
Int. Cl. F03h *1/00, 5/00;* **H05h** *11/00*
U.S. Cl. 60—202 **9 Claims**



At least two parallel annular electrodes are disposed on the outside dielectric surface of the body starting from the forward edge thereof, perpendicularly to the direction of the symmetry axis of a magnetic field around the body. A propulsion electromagnetic force field is produced around the body such as to substantially decrease the overpressure in front of said moving body while accelerating the surrounding fluid backward and aside from said body, thereby to reduce the shock wave due to said overpressure.

3,662,555

METHOD FOR OPERATING A HYBRID ROCKET ENGINE

Orval E. Ayers, and Niles C. White, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 11, 1963, Ser. No. 329,928
Int. Cl. C06d *5/10*
U.S. Cl. 60—220 **10 Claims**

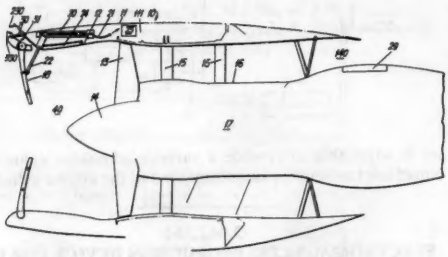
In the method of operating hybrid-propellant rocket engines wherein a fluid oxidizer is introduced into the combustion chamber of said engine to support the combustion of a solid fuel disposed in said chamber thereby generating thrust, the improvement which comprises first introducing into said chamber as a first oxidizer a member selected from the group consisting of hydrogen peroxide and water-hydrogen peroxide mixtures rich in hydrogen peroxide to support combustion upon ignition and thereafter introducing water to support continued combustion of said solid fuel while ceasing the introduction of said first oxidizer.

3,662,556

GAS TURBINE ENGINE

Michael Poucher, Duffield; Leslie John Brooks, Aston-On-Trent, and Geoffrey William Morris, Breaston, all of England, assignors to Rolls-Royce Limited, Derby, England

Filed Jan. 12, 1971, Ser. No. 105,808
Claims priority, application Great Britain, Jan. 14, 1970, 1,842/70
Int. Cl. F02k *3/04, 11/00*
U.S. Cl. 60—226 R 15 Claims



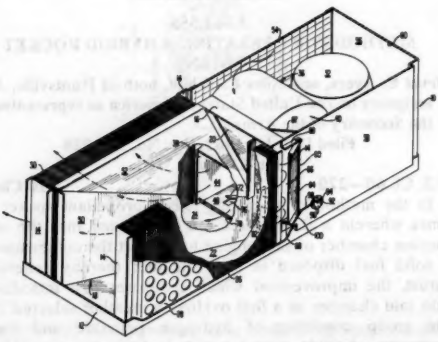
A gas turbine power plant includes an outer casing having an upstream end and a downstream end, a main air intake adjacent the upstream end and a gas outlet at the downstream end of said outer casing, first obturating means movable between an inoperative position wherein it is fully retracted so as not to interfere with a flow of air through said main air intake and an operative position wherein it extends partially to obturate the said main air intake, an auxiliary air intake defined in said outer casing, second obturating means movable between an operative and an inoperative position respectively to permit and to prevent ingress of air into said auxiliary air intake, and powered means for moving said first and second obturating means so that they are both in their respective operative positions substantially at the same time and in their respective inoperative positions substantially at the same time, and when in their operative positions increase the average velocity of the ingested air but to below Mach 1 under standard take-off and landing engine speeds.

3,662,557

ASPIRATOR DISPOSAL SYSTEM FOR AIR CONDITIONER EVAPORATOR CONDENSATE

David E. Morgan, Harrisonburg, Va., assignor to Dunham-Bush, Inc., Harrisonburg, Va.

Filed Oct. 5, 1970, Ser. No. 77,931
Int. Cl. F25b *47/00*
U.S. Cl. 62—279 11 Claims



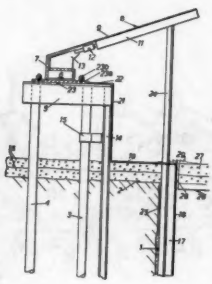
The scroll housing for a centrifugal blower is provided with a narrow elongated slot completely across the width of the housing and along the bottom of the same upstream of the scroll outlet which intersects the condensate drain pan. A plurality of laterally spaced, liquid smashing fingers extend upwardly at approximately 45° to the direction of flow, downstream of the aspirator slot, with the fingers struck out from the scroll bottom to define secondary aspirator slots downstream of the fingers. The bottom edge of the scroll housing, at its outlet is also upwardly inclined in the direction of flow to direct the condensing air carrying the atomized condensate against the full surface of the condenser coil positioned in the path thereof, for evaporation by thermal exchange. A rectangular opening leads from the condenser chamber downstream of the scroll housing and an adjustable door covered opening associated with the room sidewall of the unit and aligned therewith allows fresh makeup air to join the recirculated room air passing through the filter and the evaporator coil and separated from the condensing air by an appropriate bulkhead.

3,662,558

IN-GROUND STORAGE ARRANGEMENT FOR LIQUEFIED GASES

Robert G. Jackson, Hornchurch, England, assignor to Conch International Methane, Nassau, Bahamas

Filed Sept. 28, 1970, Ser. No. 76,045
Claims priority, application Great Britain, Nov. 3, 1969, 53,755/69
Int. Cl. B65g *5/00*
U.S. Cl. 61—0.5 10 Claims



A large-scale in-ground storage facility for liquefied gas at cryogenic temperatures consists of an open cavity in the ground covered by an impervious roof sealed at its periphery to a ring-beam extending around the rim of the cavity, which is also sealed to the upper rim of the wall of the cavity. The ring-beam rests on a support structure which extends around the mouth of the cavity, and the ring-beam is mounted on the support structure by thermal expansion means which permit limited relative movement between the ring-beam and its support structure to accommodate thermal expansion and contraction.

3,662,559

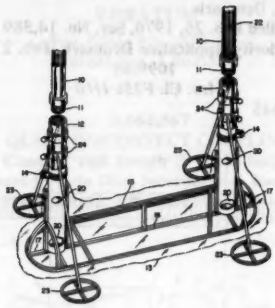
ANCHORAGE FOR BOAT DOCKS

Wesley K. Swift, 3434 19th Ave., Moline, Ill.

Filed Nov. 24, 1969, Ser. No. 879,383
Int. Cl. E02b *3/23*; E02d *27/42*
U.S. Cl. 61—46 6 Claims

This disclosure relates to an anchorage for boat docks (piers, wharves and the like) for small boats and pleasure water craft, which anchorage can be positioned and retained in position without consideration of the nature of the surface of the water bed. Further, the anchorage can be placed into position with the use of the small boat, a wrench, and a level only. This method of positioning an anchorage can be utilized to stabilize a plurality of piers and then as the base for

the attachment of prefabricated members to form any desired form or design of dock or wharf. The installation of



the anchorage does not require any type of pile driving to securely fasten the anchorage to the surface of the water bed.

3,662,560

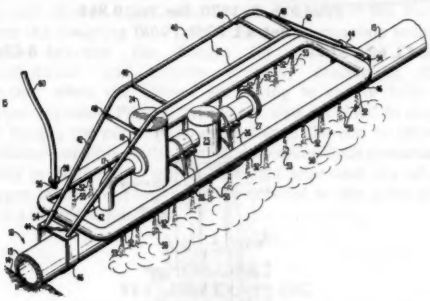
VALVE GUARD AND BURYING METHOD AND APPARATUS

Anthony H. Veazey, Belle Chasse, La., assignor to Brown & Root, Inc., Houston, Tex.

Filed Apr. 3, 1970, Ser. No. 25,367

Int. Cl. F16l *1/00*; E02f *5/02*

U.S. Cl. 61—72.4 **8 Claims**



A method and apparatus for burying an underwater pipeline section and a generally perpendicularly disposed tap-off valve into the bed of the body of water. A tubular bridge member is constructed over the tap-off valve and the valve is surrounded with a generally rectangular high pressure fluid manifold having a plurality of downwardly disposed nozzles positioned along the lateral sides thereof. The burying operation is accomplished by connecting a high pressure fluid line to the manifold and jetting away the bed surrounding the pipeline section and valve to enable the structure to descent within the waterbed.

3,662,561

COOLING APPARATUS

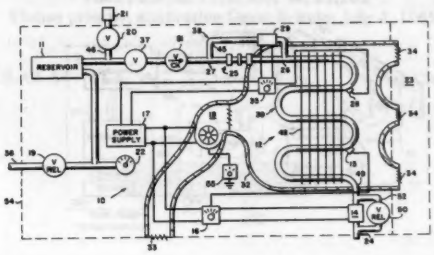
Michael J. Schroeder, Carrollton, Tex., assignor to Veskol, Inc., Garland, Tex.

Filed July 30, 1970, Ser. No. 59,643

Int. Cl. F25d *15/00*

U.S. Cl. 62—119 **10 Claims**

Apparatus for use in a cryogenic gas cooling system for conditioning liquid cryogenic gas prior to introducing the same to an evaporator where the conditioned gas is vaporized, and an improved cryogenic gas cooling system



utilizing the conditioning apparatus to provide a more efficient cooling system and to provide improved temperature control of a space to be cooled.

3,662,562

APPARATUS FOR THE FORMATION AND SEPARATION OF SOLID MATERIALS FROM A LIQUID

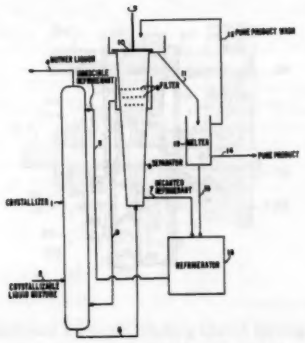
Herbert Frederick Wiegandt, Ithaca, N.Y., and Regis Lafay, Suresnes (Hauts de Seine), France

Original application Oct. 7, 1966, Ser. No. 585,126, now Patent No. 3,541,804. Divided and this application Mar. 25, 1970, Ser. No. 25,614

Claims priority, application France, Oct. 8, 1965, 34363

Int. Cl. B01d *9/04*

U.S. Cl. 62—123 **1 Claim**



An apparatus for selective crystallization and separation of crystals from a liquid mixture whereby an immiscible refrigerant contacts the liquid mixture in a vertical cylindrical crystallizer thereby separating the solid particles from the mixture and entraining said particles en route to a vertical truncated separator.

3,662,563

AUTOMOTIVE AIR CONDITIONING SYSTEM UTILIZING SEPARATE CONDENSERS

Gustav H. Sudmeier, 2708 Torrance Blvd., Torrance, Calif.

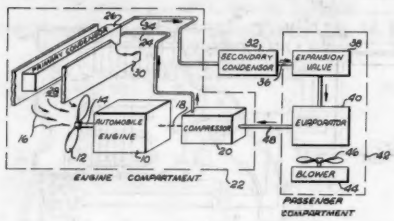
Filed July 1, 1970, Ser. No. 51,584

Int. Cl. B60h *3/04*

U.S. Cl. 62—243 **2 Claims**

An air-conditioning system for automobiles is disclosed, in which a fluid refrigerant is cycled from a compressor, first through primary and secondary condensers, then through an

expansion valve and an evaporator, to cool the interior of the automobile. The primary condenser is positioned in the engine compartment and is radially displaced from the engine



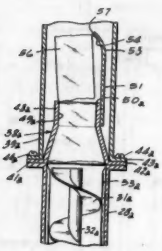
fan while the secondary condenser is located outside the automobile, e.g. affixed to the undercarriage of the automobile. The compressor is also located in the engine compartment and the evaporator is fixed in the passenger compartment.

3,662,564

ICE MAKER CONSTRUCTION

Jack F. Clearman, Stevensville, Mich.; Leonard W. Ohlsson, St. Paul, Minn., and Michael H. Mackin, Kankakee, Ill., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 17, 1969, Ser. No. 867,222
Int. Cl. F25c *1/14*
U.S. Cl. 62—320 **8 Claims**



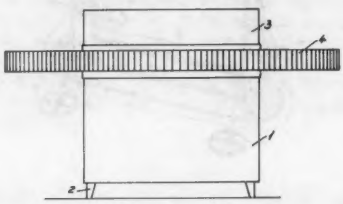
An ice maker of the type employing a refrigerated chamber and a harvesting auger positioned with its flights in scraping relation to inner walls of the refrigerated chamber for continuously scraping ice particles from the walls. A screw shaft co-rotatable with the harvesting auger drives the ice product harvested by the auger in the form of a confined columnar path through a discharge conduit and forces the ice product through a compression means similar to an extrusion member which may be of any one of a number of configurations to produce variously configured ice products, such as "ice cubes", ice chips, ice flakes or cracked ice, depending upon the particular requirements of the user. The machine is further characterized by releasable attachment means removably securing one of the extrusion members at an outermost end of the screw shaft, thereby to facilitate interchanging one extrusion member for another of a different configuration to adapt the machine for producing differently configured ice products.

3,662,565

FREEZING APPARATUS HAVING A ROTATABLE HORIZONTAL FREEZING STRUCTURE

Hans Gram, Vojens, Denmark, assignor to Brodrene Gram A/S, Vojens, Denmark

Filed Feb. 26, 1970, Ser. No. 14,589
Claims priority, application Denmark, Feb. 27, 1969, 1099/69
Int. Cl. F25c *1/10*
U.S. Cl. 62—345 **2 Claims**



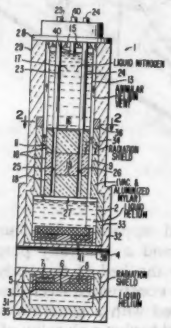
A freezing apparatus comprises a multitude of horizontally disposed arms extending radially from a rotatable housing in which means are provided for circulating a freezing medium through each of said arms.

3,662,566

CRYOSTAT HAVING HEAT EXCHANGING MEANS IN A VENT TUBE

William J. Brand, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Feb. 9, 1970, Ser. No. 9,811
Int. Cl. F25b *19/00*
U.S. Cl. 62—514 **8 Claims**



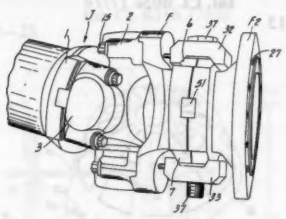
A cryostat is disclosed which includes a liquid helium chamber for cooling an object such as a superconducting solenoid to cryogenic temperatures. A vent tube is connected in gas communication with the liquid helium chamber and extends outwardly therefrom for venting vaporized helium. An elongated plug partially closes off the vent tube and defines an annular gas passageway in the space between the plug and the inside wall of the vent through which the evolved gaseous helium is vented for cooling the inside wall of the vent tube. The plug includes a liquid nitrogen chamber and thermal insulation is interposed in the plug between the liquid nitrogen and liquid helium chambers to provide a thermal barrier therebetween. The use of liquid nitrogen in the plug improves the thermal isolation of the liquid helium

chamber from the surrounds and reduces the liquid helium consumption.

ERRATUM

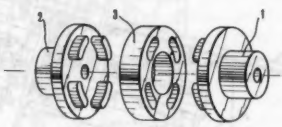
For Class 62—279 see:
Patent No. 3,662,557

3,662,567
QUICK DISCONNECT COUPLING
William T. Condon, and Joseph P. Meli, both of Rockford, Ill., assignors to Twin Disc, Incorporated, Racine, Wis.
Filed Jan. 13, 1971, Ser. No. 106,103
Int. Cl. F16d *3/16*
U.S. Cl. 64—6 **9 Claims**



A quick disconnect coupling for a power transmission or the like and including a pair of separable flanges each having tapered opposed surfaces, clamps provided for said opposed surfaces to thereby releasably clamp said flanges together, quick releasable means for holding said clamps against said tapered surfaces of said flanges, and resilient means for urging said clamps off of the tapered surfaces of the flanges when the coupling is to be released. The coupling includes means between the flanges for transmitting torque therebetween and thereby drivingly connecting them together when the clamps are acting to rigidly hold the flanges together. Piloting means are also provided in one of the flanges for piloting the other flange thereon to thereby facilitate assembly of the unit. The coupling finds particularly utility in connection with a universal joint and one of the flanges of the coupling is rigidly secured to the yoke of of such a universal joint.

3,662,568
FLEXIBLE COUPLING
Takeshiro Kashima, Kanagawaken, and Isamu Onaya, Chibaken, both of Japan, assignors to Pacific Metals Co. Ltd., Tokyo, Japan
Filed Feb. 16, 1971, Ser. No. 115,602
Int. Cl. F16d *3/78*
U.S. Cl. 64—13 **3 Claims**

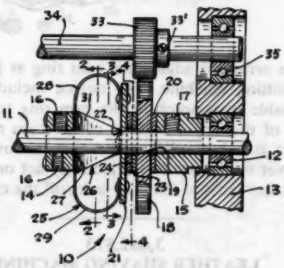


In a flexible coupling composed of two coupling halves and an intermediate elastic ring inserted between the two coupling halves, the improvements that each of said two coupling halves has on its inside surface claws of height equivalent to half of the thickness of said intermediate ring and that said intermediate ring is provided with plurality of openings of same shape as the cross section of said claws.

3,662,569
UNIVERSAL JOINTS
Ralph Williams, Coventry, England, assignor to The Torrington Company Limited, Coventry, England
Filed June 30, 1970, Ser. No. 51,102
Claims priority, application Great Britain, July 4, 1969, 33,807/69
Int. Cl. F16d *3/32*
U.S. Cl. 64—17 A **5 Claims**

A universal joint is disclosed which is made primarily of plastic. A center cube of the joint has two pairs of opposed rod ends. The arms of bifurcate members may be molded directly about the rod ends, or on a bearing mounted about the rod ends. The bifurcate members may be all plastic or plastic-covered steel. The center cube and rod ends may be molded as one integral plastic unit or, if desired, the rods may be made of steel with the center cube made of plastic and molded about the rods.

3,662,570
TORQUE LIMITING CLUTCH
Joseph F. Chinlund, deceased, 1224 Glenoak Lane, late of Northbrook, Ill. (Carol B. Chinlund, executrix)
Filed Mar. 19, 1970, Ser. No. 20,956
Int. Cl. F16d *7/02*
U.S. Cl. 64—30 C **9 Claims**
This application filed under Rule 47.

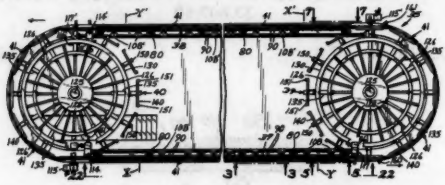


There is disclosed a torque limiting clutch having a pair of cooperable torque transmitting members coupled by a pair of clutch members. Torque is transmitted via leaf spring means secured to one torque transmitting member and one clutch member. The leaf spring means is bowed and urges the clutch members together. The amount of torque which the clutch can transmit before slippage occurs between the clutch members is adjustable by changing the amount of bowing in the leaf spring means.

3,662,571
KNITTING MACHINE
Rienk J. Muller, Minneapolis, Minn., assignor to Munsingwear, Inc., Minneapolis, Minn.
Filed Oct. 5, 1970, Ser. No. 77,869
Int. Cl. D04b *29/00*
U.S. Cl. 66—7 **14 Claims**

A knitting machine designed to produce a continuous length of knitted fabric in a course-wise direction wherein knitting needles are mounted for reciprocating knitting

movements in needle-carrying sections linked together to form a continuous oval unit. The needle-carrying sections are rotated relative to a plurality of threads and to preset cams which reciprocate the needles in knitting movements. A plurality of hooks are fixed for movement in a continuous oval



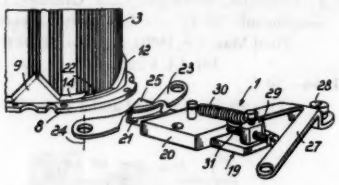
path with a straight portion thereof extending adjacent a straight portion of the needle-carrying sections, with the hooks cammed to engage the knitted fabric as it comes from the needles to provide a wale-wise bias on the fabric as it is knitted.

3,662,572

JACK SELECTION DEVICE FOR CIRCULAR KNITTING MACHINES

Francesco Lonati, Via S. Polo 11-Brescia, Milan, Italy

Filed Apr. 23, 1970, Ser. No. 31,294
Claims priority, application Italy, Apr. 30, 1969, 16.251A/69
Int. Cl. D04b *15/68, 15/32*
U.S. Cl. 66—50 R **1 Claim**



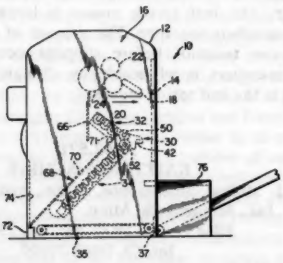
A device arranged adjacent a cam ring at jack level in a circular knitting machine. The device includes a movable cam insertable in a notch in the cam ring to maintain the continuity of the upper surface of the cam ring for action upon lower jack butts. When the cam is moved out of the notch a lever is activated to selectively act on jack butts to force the lower butts of selected jacks off the cam ring.

3,662,573

LEATHER SHAVING MACHINE

Lando J. Schwaller, and Albert J. Razal, both of Sheboygan, Wis., assignors to Akzona Incorporated, Asheville, N.C.

Filed May 15, 1970, Ser. No. 37,732
Int. Cl. C14b *17/00*
U.S. Cl. 69—42 **5 Claims**



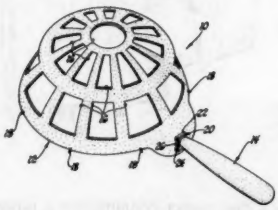
A leather hide shaving machine including laterally extending leather shaving means and laterally extending conveyor means subjacent the shaving means substantially coextensive therewith for conveying hides away from the shaving means to a point remote from the hide feed point for subsequent transport to other types of leather processing machines. To circumvent contamination of a shaved hide by shaving debris precipitated during the shaving operation and accumulated on the conveyor means, a conveyor according to the present invention comprises a plurality of shafts each fixedly supporting a plurality of laterally spaced discs the peripheries of which support the hide during transport away from the shaving means but permit leather debris from the shaving means to fall through the lateral spaces between the discs.

3,662,574

WIG WASHER AND SETTER

Shirley A. Groat, 1205 Genessee, Royal Oak, Mich.

Filed Sept. 18, 1969, Ser. No. 859,011
Int. Cl. B05c *11/14*
U.S. Cl. 68—213 **7 Claims**



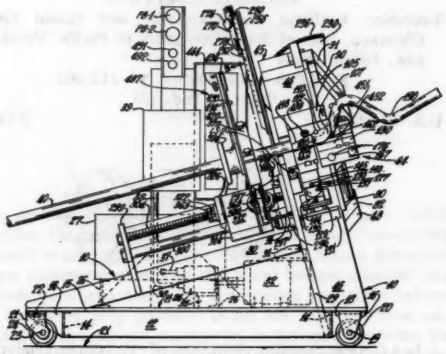
A bulbous means having a convex exterior for supporting a wig and a concave interior with openings therethrough and a removable handle extending from the exterior thereof. Also included is a skull shaped support having a chamber on the interior and passages communicating between the chamber and the skull portion and an inlet passage for communicating gases to the chamber whereby the bulbous means may be disposed over the skull shaped support with a wig thereon for drying of the wig.

3,662,575

METHOD AND APPARATUS FOR BENDING TUBING

Daniel A. Zmuda, Toledo, Ohio, assignor to Oldberg Manufacturing Company, Grand Haven, Mich.

Filed Feb. 26, 1970, Ser. No. 14,441
Int. Cl. B21b *37/08;* **B21d** *11/02*
U.S. Cl. 72—21 **20 Claims**



The disclosure embraces a method of and apparatus for forming or impressing successive bends in tubing, such as exhaust pipes and tail pipes particularly for replacement purposes in internal combustion engine exhaust systems of au-

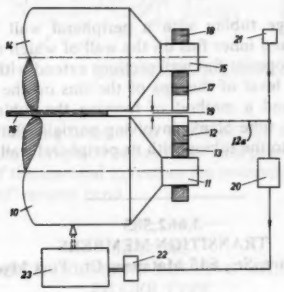
tomotive vehicles, the method and apparatus providing for forming successive bends of various depths and angularities and especially involved and improved method and means for indexing the tubing for spacing the bends and indexing the depth and angularity for each bend while maintaining positive control of the tubing during the successive operations to assure the desired orientation of the bends in the tubing.

3,662,576

CONTROL FOR ROLL GAP OF A ROLLING MILL

Siegfried Girlatschek, Bremen, Germany, assignor to Vereinigte Flugtechnische Werke Fokker GmbH, Bremen, Germany

Filed Apr. 13, 1970, Ser. No. 28,351
Claims priority, application Germany, June 21, 1969, P 19 31 654.2
Int. Cl. B21b *37/08*
U.S. Cl. 72—21 **10 Claims**



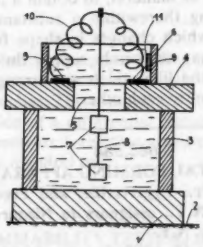
A feedback control system for a gap between rolls in a mill includes a variable inductance with a core on one roll and an armature on the other roll. This inductance, as well as a reference inductance and two auxiliary inductances, are interconnected to establish AC biased bridge. The relative phase of the bridge diagonal voltage is used to control the gap width. The pick up inductance and one of the auxiliary inductance are mounted in physical proximity to each other.

3,662,577

APPARATUS FOR SHAPING METALLIC PIECES BY SHOCK WAVES

Gerard Nicot, Pamiers, France, assignor to Creusot-Loire, Paris, France

Filed July 23, 1970, Ser. No. 57,733
Int. Cl. B21d *26/08*
U.S. Cl. 72—56 **8 Claims**



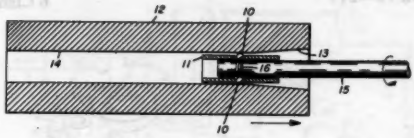
Metallic pieces are shaped by shock waves created by firing a charge within the piece to be shaped and shortly thereafter by the firing of a charge on top of a cap seated on the piece to be shaped. The cap has a central opening into the piece to be shaped and into a receptacle opening upwardly and located on the cap, the second explosive charge being located within the receptacle.

3,662,578

TURBULENCE PROMOTER FORMATION

Thomas E. Gleason, Campbell, and Charles C. Ripley, San Jose, both of Calif., assignors to General Electric Company

Filed June 28, 1968, Ser. No. 741,073
Int. Cl. B21d *13/04*
U.S. Cl. 72—75 **14 Claims**



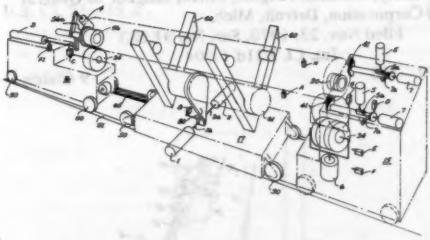
A method and an apparatus for forming fluid turbulence promoters on the outer surface of tubes is disclosed. Typically, a set of hardened balls is pressed against the tube surface with sufficient force to deform the tube surface. Simultaneously, the balls and tube are moved relatively rotationally and longitudinally so that depressed grooves are formed in the tube surface. By varying the relative movement direction and speed and groove depth, a wide variety of groove patterns may be produced.

3,662,579

METHOD AND APPARATUS FOR ROLL FORMING ENDS OF HELICALLY CORRUGATED PIPE

Clarence P. Lewis, Carlisle, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Oct. 7, 1970, Ser. No. 78,892
Int. Cl. B21d *17/04*
U.S. Cl. 72—105 **16 Claims**

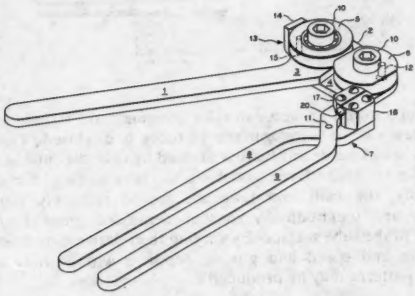


Method and apparatus for forming one or more annular corrugations and a flange on the ends of a length of helically corrugated pipe. The method involves forming the two ends, one at a time. The trailing end of the pipe, as it comes from a pipe forming machine or the like, is located axially in a predetermined relation to a forming apparatus, and the trailing end is formed while the length of pipe is backed up under pressure on the leading end and is supported intermediate its ends. Rotational force is applied to both ends of the pipe to avoid distortion. Thereafter, the leading end is formed while the length of pipe is backed up under pressure on the trailing end and is supported intermediate its ends; and again rotational force is applied to both ends of the pipe.

The apparatus comprises two units in tandem, disposed parallel to the pipe axis, and the pipe is moved, transversely of its axis, successively to the two units. In the first unit a forming section is in a fixed position, and a back-up and thrust section and an intermediate pipe supporting section

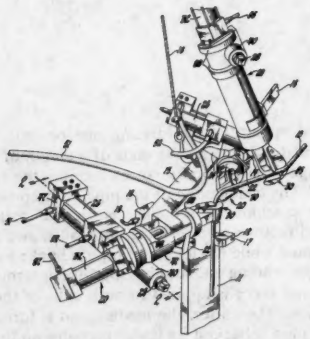
are movable in a 2:1 ratio to take care of different pipe lengths. In the second unit, a back-up and thrust section is in a fixed position, and a forming section and an intermediate pipe supporting section are arranged as above described, to take care of different lengths of pipe.

3,662,580
TUBE BENDER AND METHOD
Harlan D. Power, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Mar. 17, 1970, Ser. No. 20,330
Int. Cl. B21d *7/02*
U.S. Cl. 72—217 **6 Claims**



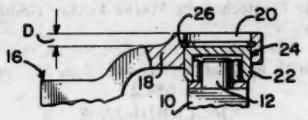
A tube bender, particularly adapted to bend plastic coated tubing, having a pivotally fixed tube supporting wheel, a pliers-like tube gripping means for holding and bending a tube around said wheel, and a roller positioned to encompass the tube between said roller and said wheel to roll said tube to said wheel while bending the same by actuating said gripping means to bend said tube around said wheel.

3,662,581
TUBE BENDER
Robert E. Early, Madison Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 23, 1970, Ser. No. 91,683
Int. Cl. B21d *11/04*
U.S. Cl. 72—305 **9 Claims**



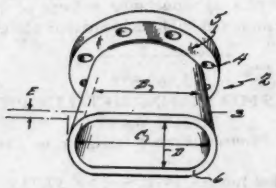
A tube bending apparatus for simultaneously forming multiple bends in metallic tubing, the tubing being secured at opposite ends and a plurality of double actuating forming or bending heads being used to form the bends, one such double actuating bending head being used for each of the bends.

3,662,582
HEAT-EXCHANGE TUBING AND METHOD OF MAKING IT
Fred W. French, Morris, Conn., assignor to Noranda Metal Industries Inc.
Filed May 18, 1970, Ser. No. 38,132
Int. Cl. B21d *53/06*
U.S. Cl. 72—367 **8 Claims**



Heat-exchange tubing with a peripheral wall of oblong cross-section, and inner fins on the wall of which the fins on either of two opposite flat wall sections extend with their tips at least to the level of the tips of the fins on the other flat wall section, and a method of forming the tubing from a round inner-fin tube blank, involving partially flattening the round blank into the tubing with its peripheral wall of oblong cross-section.

3,662,583
TRANSITION MEMBERS
Charles H. Moore, Sr., 645 Matanzas Ct., Fort Myers Beach, Fla.
Filed Feb. 6, 1970, Ser. No. 9,324
Int. Cl. B21d *41/00*
U.S. Cl. 72—370 **4 Claims**

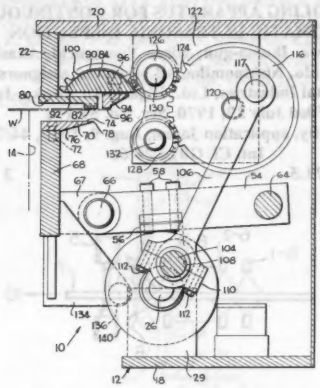


A round tubular work-piece of substantially uniform diameter and wall-thickness is forged from within, by a particularly shaped spud or mandrel, to obtain a nozzle or connector element having therewithin a substantially uniform cross-sectional area which changes in shape from round to oblong whereby it may uniformly supply fluid to a larger number of tubes or the like which are arranged in spaced parallelism with respect to each other.

3,662,584
SHEET METAL FORMING APPARATUS
Clarence O. Jones, Jr., Eggertsville, and Fred F. Snuszki, Kenmore, both of N.Y., assignors to Niagara Machine & Tool Works, Buffalo, N.Y.
Filed June 15, 1970, Ser. No. 46,102
Int. Cl. B21d *31/00*
U.S. Cl. 72—411 **7 Claims**

A sheet metal forming apparatus comprising an upstanding member having a pressure foot on the upper end thereof movable into a work clamping position. A rotatable forming

member engages the free edge of the workpiece and reversely bends it about a lip formation provided on the pressure foot. Prior to the completion of the bending operation, the pressure foot is pivotally withdrawn from the workpiece to



permit the forming member to overbend the reversely bent portion of the workpiece beyond 180° and permit the natural resiliency of the material to restore the reversely bent portion to a true 180° reverse bend.

3,662,585

FEED MECHANISM FOR ROLLING MILL OF THE PILGER TYPE

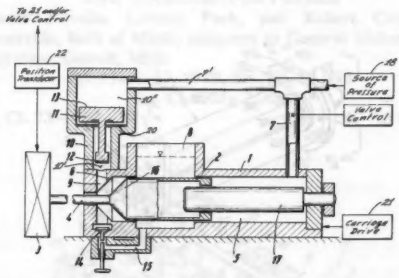
Manfred Bellmann, Ratingen, Germany, assignor to Mannesman Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 1, 1970, Ser. No. 68,669

Claims priority, application Germany, Sept. 10, 1969, P 19 46 798.2

Int. Cl. B21b *25/02*

U.S. Cl. 72—445 **6 Claims**



In a feed mechanism for pilger rolling mills, having a mandrel rod coupled to a piston of a liquid brake, cooperating with a brake chamber. The compressed liquid in the chamber acts upon one side of a differential piston acted upon on its other side by a pressure force that persists beyond the instant of reversal of the mandrel rod.

3,662,586

FLAMMABILITY TESTING DEVICE

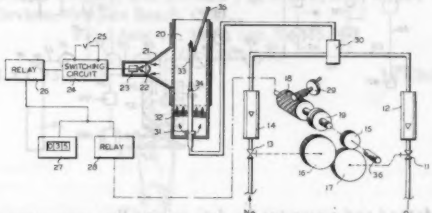
Shigeru Suga, Yoyogi 5-20-2, Shibuya-ku, Tokyo, Japan

Filed June 15, 1970, Ser. No. 46,105

Int. Cl. G01n *25/00*

U.S. Cl. 73—15 R **9 Claims**

A flammability testing device. A combustion chamber having a specimen holder therein for holding a specimen and a gas inlet and means for distributing the flow of gas from the inlet to the entire horizontal cross sectional area of the chamber so that a uniform stream of gas will rise in the chamber, which chamber has conduit means coupled to said inlet. A nitrogen flow control valve and a nitrogen flowmeter are connected in series and an oxygen flow control valve and an oxygen flowmeter are connected in series, and both are connected to said chamber. The valves have flow characteristics which when combined with each other produce a



constant total flow of nitrogen and oxygen. Constant speed valve driving means operate said valves according to said characteristics. A light sensing means adjacent said combusting chamber receives light from the burning specimen and produces an electric current in response thereto, and switching means is connected between said light sensing means and said valve driving means for stopping said valve driving means when said light sensing means no longer senses light from a specimen in said chamber.

3,662,587

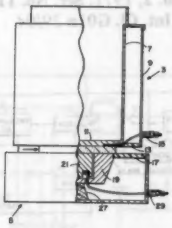
THERMAL CONDUCTIVITY APPARATUS

Edwin L. Allen, and Donald A. Willoughby, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed Oct. 2, 1970, Ser. No. 77,461

Int. Cl. G01n *25/20*

U.S. Cl. 73—15 A **1 Claim**

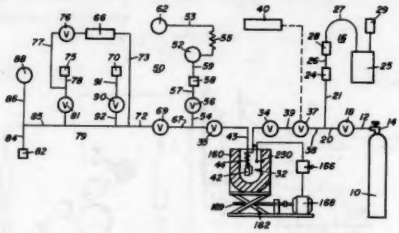


An apparatus for determining the thermal conductivity of solid propellant samples. The apparatus includes a vessel having a heaVy copper base plate for providing a heat source to one side of a propellant sample. The plate is connected to a thermocouple for measuring it temperature, which should be essentially identical to the temperature of the upper surface of the sample. A copper metering block is in contact with the lower surface of the sample and this block is connected to a second thermocouple for measuring its temperature, which should be essentially identical with the temperature of the lower surface of the sample. A guard block is spaced from and surrounds the metering block to prevent heat loss from the metering block.

3,662,588
DETERMINING IMPURITIES IN HELIUM

David E. Emerson; George W. Weems, and Clarence A. Hoffman, all of Amarillo, Tex., assignors to The United States of America as represented by the Secretary of the Interior

Filed Apr. 28, 1970, Ser. No. 32,668
Int. Cl. G01n 7/00; B01d 51/00
U.S. Cl. 73—23 2 Claims

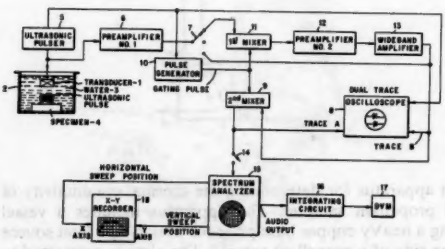


Method and apparatus for determining the component impurities of helium. A sample of helium flowing in an analyzer system, including conduits having as a fixed part thereof a trap and coil assembly, is maintained at above atmospheric pressure and a rate of flow which allows its passage freely through the assembly being maintained at the temperature of liquid helium. Impurities are solidified and thereafter isolated by evacuation of the gaseous content of the assembly. The subsequent warming of the assembly provides a gaseous sample of the impurities for analysis in a mass spectrometer of the system. The direction of gaseous flow and the reading of data from instruments of the system are facilitated by valves distributed among the conduits, including a time controlled sampler valve. Liquid helium is maintained at a proper level with respect to the trap and coil assembly by an automatically controlled lift to which is fixed a Dewar vessel containing the liquid helium.

3,662,589
ULTRASONIC FLAW DETERMINATION BY SPECTRAL ANALYSIS

Laszlo Adler, Knoxville, and Hubert L. Whaley, Powell, both of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 2, 1971, Ser. No. 111,958
Int. Cl. G01n 29/04
U.S. Cl. 73—67.8 3 Claims

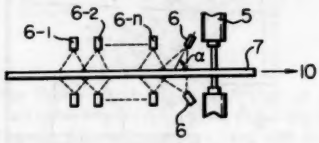


A method of quantitatively determining the size and orientation of flaws within a material. A broadband pulse having a frequency width of at least several MHz is used for an input pulse from a transducer which is directed toward the test material which may contain a flaw, and the average frequency interval between interference maxima in the reflected spectrum is relatable to both the size and orientation of the flaw. An experimental method using two known angle changes allows determination of the size and angle of randomly oriented discontinuities within metal specimens.

3,662,590
PRECOOLING APPARATUS FOR CONTINUOUS AUTOMATIC ULTRASONIC INSPECTION

Toshio Shiraiwa, Ikoma-gun; Hisao Yamaguchi, Akashi, and Yasunori Kido, Nishinomiha, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Higashi-ku, Osaka, Japan

Filed July 29, 1970, Ser. No. 59,111
Claims priority, application Japan, Aug. 9, 1969, 44/75367
Int. Cl. G01n 29/00
U.S. Cl. 73—71.5 3 Claims

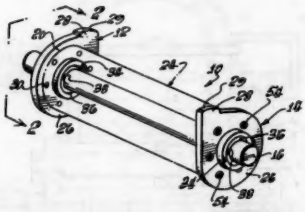


A continuous automatic ultrasonic inspection apparatus detects flaws in a material by transmitting pulses or continuous waves into the material to be inspected through the medium of a laminar flow water jet column. The precooling apparatus is provided near the laminar flow water jet column and improves the accuracy of flaw detection of the material at high temperature moving at high speed and also increases the maximum inspection temperature.

3,662,591
TUBE TORQUING DEVICE

Ido A. Bons, Duarte, Calif., assignor to Whittaker Corporation

Filed Sept. 18, 1970, Ser. No. 73,425
Int. Cl. G01n 3/22
U.S. Cl. 73—99 4 Claims



A device for torquing tubes provided with apertured end members comprises, in its simplest embodiment, a pair of lobed, generally-circular plates with each lobed plate having a plurality of radially spaced holes therethrough for connection to the apertured end members of a tube. The lobe portion of each lobes plate is eccentrically positioned with respect to the axis of rotation of that plate to cause rotation of that plate when a force acts against the lobe. Torquing of a tube is accomplished by applying equal forces, e.g., in a press, against the lobes of each lobed plates when the latter are connected to a tube to cause the lobed plates to counter-rotate about a common axis which, in turn, torques the tubes since the tube and lobes plates are fixedely interconnected.

In a preferred embodiment, the lobed plates are provided with axially-aligned apertures which are journaled to receive a shaft in such a way that the plates are maintained in alignment by the shaft but which permits free rotation of the lobed plates about the shaft. Tubes to be

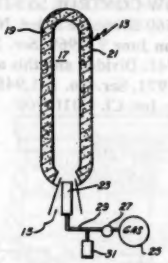
torqued are slipped over the shaft before the torquing device is assembled.

3,662,592

NON-DESTRUCTIVE TESTING DEVICE FOR THE DETECTION OF FLAWS IN SOLID ROCKET MOTORS

Robert L. Geisler, P.O. Box 6037, Edwards, Calif.

Filed Aug. 28, 1970, Ser. No. 67,825
Int. Cl. G01n *19/08*; G01b *5/28*
U.S. Cl. 73—104 4 Claims



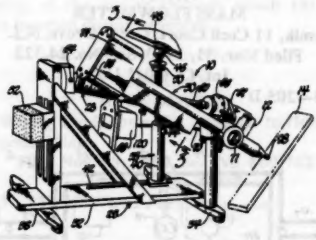
The outer surface of an inflatable bladder is coated with a sensitizing material to make it sensitive to pressure and/or temperature. The bladder is then introduced through the nozzle of a rocket motor and inflated in the cavity. Depending upon the coating, the surface of the bladder becomes marked in a pattern corresponding to the imperfections in the surface of the rocket motor cavity. The bladder is deflated and removed from the rocket motor and inserted in a transparent cavity model and reinflated. The surface of the bladder on which the imperfection pattern marks appear is visually observed through the wall of the transparent model.

3,662,593

TEST APPARATUS FOR DEPRESSING VEHICLE BRAKE AND ACCELERATOR PEDALS

Antonio Pirrello, Lincoln Park, and Robert Campbell, Roseville, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1970, Ser. No. 91,893
Int. Cl. G05g *21/00*
U.S. Cl. 73—132 3 Claims



Apparatus for depressing the accelerator and brake pedals of a vehicle. The apparatus includes a test stand that is rigidly secured in the vehicle at a position proximate the accelerator and brake pedals for supporting accelerator and brake pedal actuators.

The accelerator actuator includes a threaded shaft that is rotatably driven by a motor and engaged by a pawl so as to move axially as it is rotated, the threaded shaft being drivably coupled to the accelerator pedal so as to depress and release the accelerator pedal in accordance with the rotation of the threaded shaft. A solenoid is provided for disengaging the pawl from the threaded shaft and the threaded shaft is spring biased so as to release the accelerator pedal when the pawl is disengaged from the threaded shaft by the solenoid.

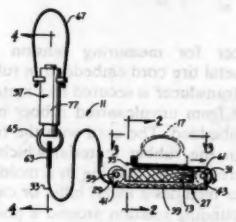
The brake pedal actuator includes a pneumatic cylinder containing a piston that is drivably coupled to the brake pedal of the vehicle so as to depress and release the brake pedal of the vehicle in accordance with the introduction of a pressurized fluid to the pneumatic cylinder.

3,662,594

SKI BINDING TESTER

Gloria L. Clifford, and Richard P. Clifford, both of 201 Via Orvieta, Newport Beach, Calif.

Filed June 15, 1970, Ser. No. 45,982
Int. Cl. G01l *5/03*
U.S. Cl. 73—133 14 Claims



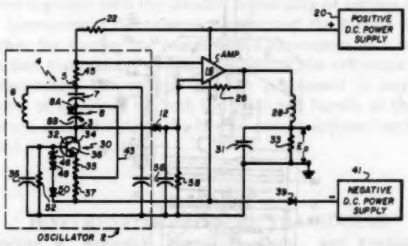
A ski binding tester for determining the force required to actuate a ski binding to permit separation of a ski and a ski boot. The ski binding tester includes a generally flexible, elongated, tension element drivingly connected to the ski boot and a scale attached to the tension element for measuring the maximum value of the pulling force applied through the tension element to the ski boot.

3,662,595

OSCILLATOR TYPE FORCE MEASURING SYSTEM INSENSITIVE TO INPUT VOLTAGE VARIATIONS

Charles E. Hurlburt, River Edge; Michael J. Lanni, Ridgewood, and Alphons Fraenkel, Fairlawn, all of N.J., assignors to The Bendix Corporation

Filed Mar. 19, 1970, Ser. No. 20,957
Int. Cl. G01l *1/14*; G01p *15/08*
U.S. Cl. 73—141 R 7 Claims



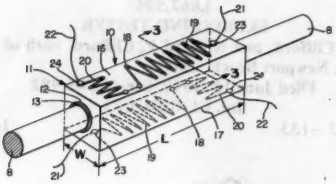
A force measuring system includes an oscillator energized by an input voltage and having a tank circuit and means for changing the impedance of the tank circuit in accordance with the movement of an element in response to an applied force. The oscillator output voltage changes with changes in impedance and is compared to the input voltage to cancel out input voltage variations. The difference between the compared voltages is used to apply a restoring force to the movable element and the restoring force is a measurement of the applied force.

3,662,596

DEVICE FOR MEASURING STRESS IN METAL TIRE CORDS

George J. Siefert, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 12, 1970, Ser. No. 88,960
Int. Cl. G01l 5/10
U.S. Cl. 73—143 12 Claims



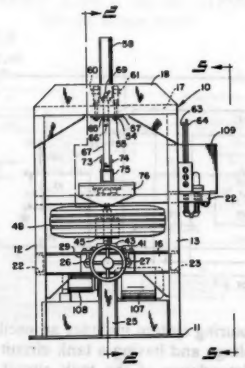
A transducer for measuring tension or compression stresses in a metal tire cord embedded in rubberized material of a tire. The transducer is secured to a metal cord which has been removed from unvulcanized rubber material in which the cord is embedded. The cord with the transducer is then repositioned in the rubber material which is then used to build an uncured tire for placing in a mold and vulcanizing. The transducer includes a metal billet or casing which is soldered in surrounding relation around a portion of the cord. Four strain gauges are secured to opposing flat surfaces of the transducer in special oriented relation to form a full gauge bridge for determining tension or compression while eliminating bending stresses. The bridge has a number of lead wires which are taken from the tire body and fastened to, for example, a Wheatstone bridge for recording the tension or compression in the cord under varying inflation conditions of the tire.

3,662,597

TIRE TESTING MACHINE

Anselm DeGhetto, Clifton, N.J., assignor to Getty Machine and Mold, Inc., Clifton, N.J.

Filed June 25, 1970, Ser. No. 49,610
Int. Cl. G01m 17/05
U.S. Cl. 73—146 9 Claims



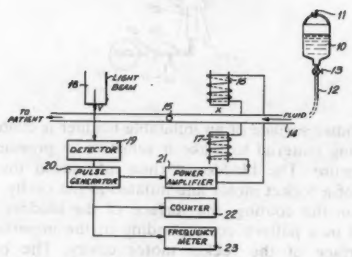
A tire testing machine capable of performing both a tire bead unseating test and a strength test in which a hydraulic piston cylinder assembly for exerting pressure against a tire is pivotally mounted for swinging movement during the unseating test and is held in a fixed position during the tire strength test. The tire supporting assembly is adjustably mounted for horizontal positioning of the tire below the piston cylinder assembly and one end of a horizontal guide arm is pivotally connected to the piston cylinder assembly for the bead unseating test. The horizontal position of the arm is adjustable with the piston cylinder assembly and different size tires may be tested by adjustments to the length of the guide arm and the position of the arm pivot. Control and recordation of the pressure exerted on the tires, the distance the pressure applying member moves and the position and pressure at which failure occurs is also provided.

3,662,598

FLOW CONTROL SYSTEM

Jordan L. Spencer, 560 Riverside Drive, New York, N.Y.

Original application June 9, 1969, Ser. No. 831,351, now Patent No. 3,605,741. Divided and this application Apr. 7, 1971, Ser. No. 131,945
Int. Cl. G01f 1/00
U.S. Cl. 73—194 E 12 Claims



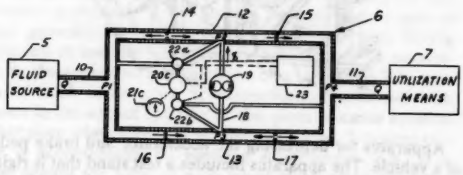
The present invention deals with an improved method and apparatus for measuring flow in fluid flow systems characterized by low flow rate. The invention utilizes the transit time or oscillatory frequency of a ball or float which moves along the direction of fluid flow and is returned to its original position by actuating a magnetic return system as it breaks a light beam or other sensing system. The cycle is repeated, with the transit time or oscillatory frequency being related to rate of fluid flow, and thus serving to indicate same for control purposes. The flow tube-ball measuring unit may take the form of a disposable insert into the flow measuring system.

3,662,599

MASS FLOWMETER

Walter Masnik, 11 Cecil Court, Cedar Grove, N.J.

Filed Mar. 31, 1970, Ser. No. 24,322
Int. Cl. G01f 1/00
U.S. Cl. 73—205 D 14 Claims



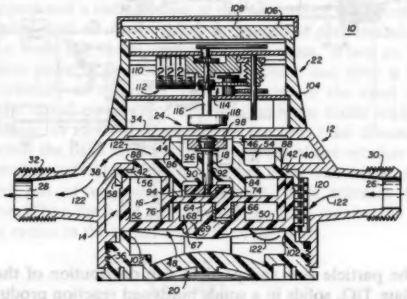
An extended viscosity range mass flowmeter comprising a pair of branch conduits connecting inlet and outlet conduits. The branch conduits each have a pair of flow restrictors comprising identical orifices with one edge sharp and the other rounded and oriented with their like edges in opposition in proceeding from inlet to outlet conduits. A constant volumetric recirculating pump connects the two branch con-

duits at points intermediate the orifices therein. A differential pressure measuring device is automatically connected between the inlet and outlet conduits or between the points intermediate the restrictors in each conduit depending upon whether the recirculating flow is greater or less than the measured flow.

3,662,600
FLUID METER

Joseph George Rosano, Jr., Roselle Park, N.J., and J. D. Coffman, Fort Worth, Tex., assignors to Gamon-Calmet Industries, Inc., Newark, N.J.

Filed Nov. 5, 1969, Ser. No. 874,123
Int. Cl. G01f *3/08*
U.S. Cl. 73—257 **8 Claims**

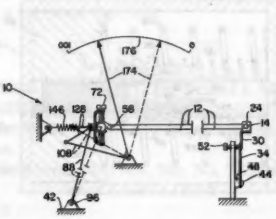


A fluid meter is disclosed which comprises a casing having first and second ports for fluid flow therethrough; a measuring chamber located within the casing, with the measuring chamber having upper and lower surfaces within which are situated entry and exit openings which communicate with the respective ports of the casing to thereby establish a vertical flow path through the measuring chamber; driven means preferably in the form of an oscillating piston located in the measuring chamber; motion transmitting means responsive to the driven means for transmitting the motion thereof to a location outside of the measuring chamber but within the casing; register means positioned outside of the casing for providing an indication of fluid flow; and magnetic coupling means responsive to the motion of the motion transmitting means for driving the register. Additionally, a removable screw-in bottom plate is provided to retain the measuring chamber within the casing and to selectively cover the bottom opening of the casing through which the measuring chamber is inserted during assembly.

3,662,601
HYGROMETER

Roger K. Strong, Doylestown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 28, 1969, Ser. No. 880,762
Int. Cl. G01n *19/10*
U.S. Cl. 73—337.5 **2 Claims**

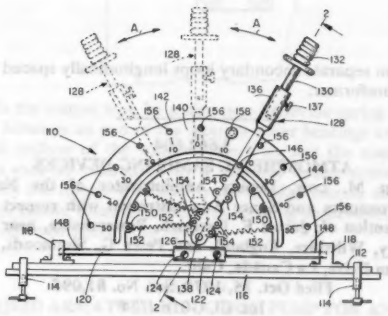


An apparatus to convert any extremely small unnoticeable non linear expanding and contracting movement exhibited by a sensing element, such as a sensing element that expands in a non linear manner with changes in the relative humidity of an atmosphere into a greatly enlarged amplified motion. An example of this latter motion is the motion exhibited by a pointer moving along an associated scale and/or the motion of a pen moving along a chart which will provide an accurate linear indication of the percent of relative humidity being sensed by the aforementioned sensing element.

3,662,602
HAND WRESTLING EXERCISE APPARATUS

Marcel Weiss, 885 Montgomery St., Brooklyn, N.Y.

Filed Feb. 25, 1971, Ser. No. 118,755
Int. Cl. A63b *21/22*
U.S. Cl. 73—381 R **14 Claims**



Hand wrestling apparatus comprising a base, and means for securing the base upon a table or the like at the edge thereof. The base includes a handle which is supported for universal articulation. A reference plate of disc-shaped character having a generally semi-circular peripheral extent is pivotally mounted upon the base and operatively associated with the handle so that the reference plate may be pivoted in a first direction toward and away from the base in unison together with the handle. A plurality of springs or the like interconnect the reference plate and the handle to one another for biasing the handle from movement in a second direction transversely of the direction of the reference plate displacement. The springs may be positioned in any of a number of locations on both the plate and handle so that the pressure exerted against the handle can be adjusted and controlled.

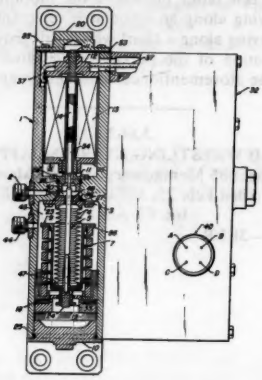
3,662,603
DIFFERENTIAL PRESSURE TRANSDUCER

Theodore R. Breunich, Stamford, Conn., and Emanuel J. Dinoia, Briarcliff Manor, N.Y., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 819,918, Apr. 28, 1967, now abandoned. This application Jan. 14, 1971, Ser. No. 106,581
Int. Cl. G01l *9/10*
U.S. Cl. 73—398 R **6 Claims**

A differential pressure transducer utilizing a transformer and a means for maintaining a constant voltage sum on the secondary leads of the transformer to eliminate errors due to spurious electrical impulses in the transducer. The extensible

end of a bellows moves a magnetically permeable core with respect to the transformer, thereby inducing different voltages on separate secondary loops longitudinally spaced along the transformer.



3,662,604

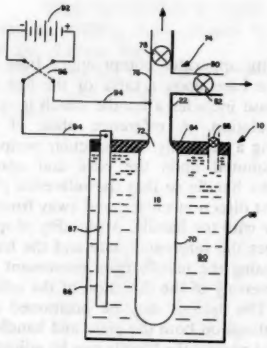
ATMOSPHERIC SAMPLING DEVICES

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of; James E. Lovelock, Bowerchalke, near Salisbury, Wiltshire, England, and Peter G. Simmonds, 5200 Palm Drive, La Canada, Calif.

Filed Oct. 15, 1970, Ser. No. 81,095

Int. Cl. G01n *1/24*

U.S. Cl. 73—421.5 R **10 Claims**



An atmosphere sampling chamber is disposed within a container. The chamber has an inlet communicating with the atmosphere to be sampled and an outlet communicating with an analysis device such as a gas chromatograph. The annulus in the container adjacent the outer walls of the chamber contains a fluid medium for pressurizing the chamber to exhaust its contents through the outlet. In one embodiment, the chamber is a gas-impervious bellows which is exhausted by feeding gas to the container. In another embodiment, the chamber is formed of a hydrogen-permeable palladium alloy tube and the fluid medium is an electrolyte capable of transporting an ionic species of hydrogen. When the tube is electrolytically connected to a counter electrode in a first evacuation polarity mode, the tube is exhausted and, sample is charged into the tube. In the reverse polarity mode, hydrogen is generated through the tube wall and acts as a purging gas and carrier gas to discharge the sample and sweep the sample through the gas chromatograph column and detector.

3,662,605

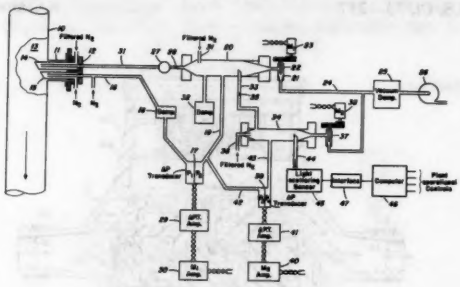
METHOD AND MEANS FOR AUTOMATING COMPUTER-CONTROLLED PRODUCTION OF PARTICULATE MATERIALS

Arthur G. Grotyohann, Lincroft, N.J., assignor to N. L. Industries, Inc., New York, N.Y.

Filed May 13, 1970, Ser. No. 36,918

Int. Cl. G01n *1/24*

U.S. Cl. 73—421.5 R **15 Claims**



The particle size and particle size distribution of the particulate TiO_2 solids in a solids burdened reaction product gas produced in a vapor phase process for making pyrogenic TiO_2 are measured by diluting a sample of the solids burdened gas by an order of magnitude of at least about 10^{12} and feeding the diluted sample to measuring-means in the form of a multi-channel light scattering sensor the read-out of which constantly measures the particle size and particle size distribution of the particulate solids in the reaction product gases being produced. It is, of course, well known that particle size and particle size distribution of particulate TiO_2 particles may be correlated with the optical properties of the pigment. Hence the read-out of the light scattering sensor will be indicative of the quality of TiO_2 pigment being produced and may be usedd manually i.e. visual observation or by electronic means to effect adjustments in the appropriate plant operational controls so as to maintain the optical properties of the pigment substantially constant and at optimum levels throughout a plant run.

3,662,606

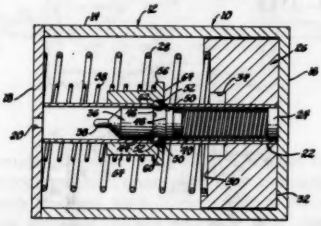
ACCELERATION SENSOR

Otakar P. Prachar, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 21, 1971, Ser. No. 108,455

Int. Cl. G01p *15/02*

U.S. Cl. 73—514 **6 Claims**



A sensor includes an operator mounted within a tubular guide for movement in one axial direction to an actuated

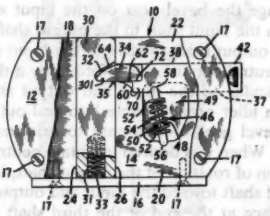
position under a spring bias. The guide is mounted coaxially of a cylindrical support. A cylindrical seismic mass is slidable coaxially of the tube and support and is normally biased axially oppositely of the operator and against an end wall of the support by a coil compression spring seating against the other end wall of the support and a radial end wall of the mass. An annular retainer is slidable coaxially of the guide tube and includes an annular groove at one end thereof which includes a radial wall merging into an axial wall opening to a radial end wall of the retainer. A peripheral groove adjacent one end of the operator includes a conical wall located at a conical angle of approximately 60° to the axis of the operator. A plurality of balls are each freely received within a respective radial aperture of the guide tube and engage both the radial and axial walls of the retainer and the conical wall of the operator groove to detent the operator against movement. The retainer walls are spring biased into engagement with the balls by a coil compression spring seating on the other wall of the support and a radial flange at the one end of the retainer. The radial wall of the retainer is spaced a predetermined distance from the radial end wall of the mass. When an acceleration pulse of predetermined amplitude and time is applied coaxially of the mass, the movement of the mass engages the radial end wall of the mass with the radial wall of the retainer to move the retainer in the one axial direction and permit the balls to be forced outwardly of the retainer by the operator conical wall as the retainer axial wall moves axially and out of engagement therewith. This releases the operator. When the balls are released, they are received in an annular recess in the radial end wall of the mass.

3,662,607

LATCHING MECHANISM

Floyd J. Milanowski, Pocomoke City, Md., and Arthur J. Bowman, Jr., Succasunna, N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Jan. 25, 1971, Ser. No. 109,419
Int. Cl. G05g *17/00*
U.S. Cl. 74—2 **12 Claims**



A latching mechanism is provided, such mechanism having a slide held in latched position by a cam received in a recess in the slide, the cam in turn being retained in holding position by a release latch. Upon application of a low magnitude force to the release latch, the cam displaces from its holding position into either the slide recess or the space which the release latch vacated upon movement thereof to unlatch the slide and allow it to slidably move to an unlatched position and perform a specified function.

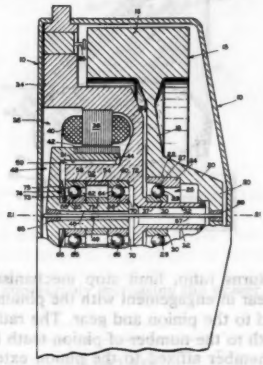
3,662,608

TWO DEGREES OF FREEDOM BALL BEARING SUSPENSION FOR A ROTOR OF A GYROSCOPE

Gunnar Johan Vold, Mahwah, N.J., assignor to The Bendix Corporation

Filed Sept. 30, 1968, Ser. No. 763,867
Int. Cl. G01c *19/16*
U.S. Cl. 74—5 **10 Claims**

A two degrees of freedom ball bearing suspension for a rotor of a gyroscope to compensate for coercive torques through the provision of a torque wire connected between a drive element of a motor and the rotor of the gyroscope, the drive element of the motor being rotatably carried by internal roller bearings mounted in a stator element of the motor and the rotor of the gyroscope being rotatably mounted on a universal ball bearing joint supported by the stator element of the motor, the rotor of the gyroscope being axially biased toward the universal ball bearing joint under tension applied through the torque wire by a disc type belleville spring positioned between an end of the internal roller bearings and an internal surface of the stator element so that the coercive torques may be minimized by a negative spring action effected by the torque wire due to the tension therein so that the total elastic restraint of the ball bearing suspension may be brought extremely close to zero.

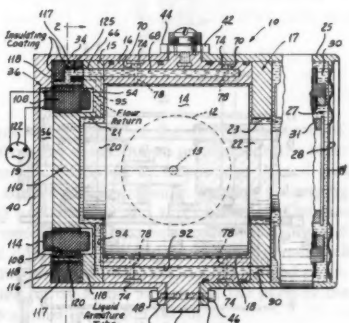


3,662,609

LIQUID ARMATURE INDUCTION PUMP FOR AN ELECTRICALLY CONDUCTIVE LIQUID TO SUPPORT A GIMBAL ELEMENT OF A GYROSCOPE IN A HYDROSTATIC BEARING

Oscar D. Jacobson, New York, N.Y., assignor to The Bendix Corporation

Filed July 1, 1969, Ser. No. 838,274
Int. Cl. G01c *19/20*
U.S. Cl. 74—5 **8 Claims**



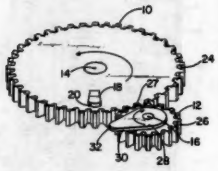
A liquid armature induction pump including a stator, liquid armature tube and magnetic shunt for pumping electrically conductive liquid such as mercury so as to hydrostatically support a gimbal element of a gyroscope in a hydrostatic bearing.

3,662,610

MULTI-TURN LIMIT STOP APPARATUS

Richard Thoen, Golden Valley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 20, 1970, Ser. No. 29,956
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.2 6 Claims



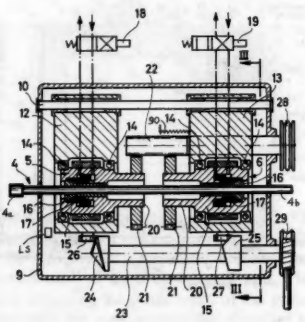
A high turns ratio, limit stop mechanism, comprising a pinion, a gear in engagement with the pinion, and stop members affixed to the pinion and gear. The ratio of the number of gear teeth to the number of pinion teeth is not an integer. The stop member affixed to the pinion extends beyond the periphery of the pinion and sweeps out an epitrochoidal path with respect to the gear pitch circle as it rotates. The stop member affixed to the gear is positioned inside the gear pitch circle. Since the ratio is non-integral, the epitrochoidal loops of the pinion stop member rotate with respect to the gear pitch circle on each gear revolution. Rotation in one direction is limited when the epitrochoidal path for the pinion stop member on a particular rotation enchoses the gear stop member.

3,662,611

APPARATUS FOR DRIVING AND FEEDING ELONGATED TOOLS OR THE LIKE

Hans Knoll, Dettingen (Wurttemberg), Germany, assignor to Tiefbohr-Technik, Dettingen (Wurttemburg), Germany

Filed Oct. 7, 1968, Ser. No. 765,349
Claims priority, application Germany, Oct. 7, 1967, P 26 02 994.0
Int. Cl. F16h *21/00*
U.S. Cl. 74—22 17 Claims



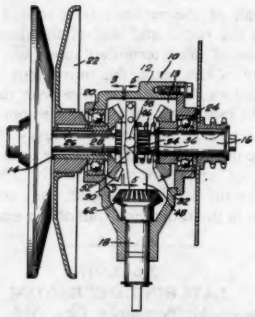
Apparatus for rotating and feeding elongated material removing tools comprises a pair of carriages which are reciprocable in opposite directions and each of which accommodates a rotary gripper movable into or away from engagement with the peripheral surface of the tool shank. When one of the grippers engages the tool and causes the tool to rotate and to move axially to advance its cutter into or along a workpiece, the gripper of the other carriage is disengaged from the tool and moves in opposite direction. Engagement and disengagement of grippers is controlled automatically and the grippers are rotated in their respective carriages.

3,662,612

REVERSING TRANSMISSION

George G. Lassanske, Oconomowoc, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 24, 1967, Ser. No. 662,949
Int. Cl. F16h *3/40*
U.S. Cl. 74—355 5 Claims



Disclosed herein is a compact, lightweight shifting or transmission mechanism with co-axial input and output shafts with each shaft carrying a bevel gear. A clutch collar or clutch dog is splined or connected to the output shaft and has lugs which engage the bevel gear on the input shaft to transfer power from the input shaft to the output shaft. Reverse rotation of the output shaft relative to the input shaft and provision of a neutral condition is afforded by a third shaft which is perpendicular to the input and output shafts and which supports an idler gear movable into and out of engagement with the bevel gears in response to axial movement of the third shaft. When it is desired to obtain neutral, or to reverse the direction of rotation of the output shaft, initial movement of the third shaft toward the input and output shafts engages a cam surface at the end of the third shaft with a cam follower on the clutch dog to move to clutch dog axially out of engagement with the gear on the input shaft and thus to obtain a neutral condition by disconnecting the input and output shafts. Continued movement of the third shaft provides for engagement of the idler gear with the gears on the input and output shafts and results in power transfer through the idler gear.

3,662,613

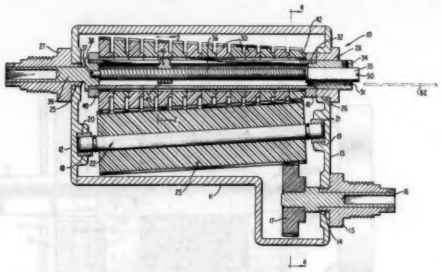
VARIABLE SPEED TRANSMISSION

Robert A. Ingalls, Springfield, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed June 11, 1970, Ser. No. 45,286The portion of the term of the patent subsequent to Aug. 26, 1986, has been disclaimed.
Int. Cl. F16h *3/08, 5/08*
U.S. Cl. 74—371 10 Claims

This invention relates to a variable speed transmission, the operative elements of which include a series of tapered output gears of different diameter but equal pitch which are rotatably mounted on a tubular member with a clutch ar-

ranged for translational movement within the tubular member and adapted to engage any one of a series of output gears to control the speed of the transmission. An input gear



tapered in a plane parallel to that of the output gears is arranged to drive an elongated cylindrical gear and to transmit therethrough the drive motion to any of the tapered output gears.

3,662,614

FINE-COARSE DRIVE MECHANISM

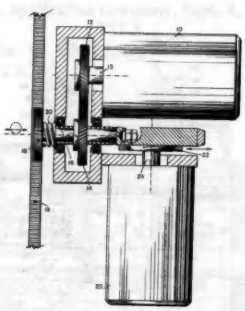
John Quilty, c/o Photon, Inc., 355 Middlesex Ave., Wilmington, Mass.

Filed Dec. 14, 1970, Ser. No. 97,799

Claims priority, application Great Britain, Dec. 15, 1969, 61,089/69

Int. Cl. F16h *35/02, 35/06*

U.S. Cl. 74—393 **5 Claims**



A pair of stepping motors form the basis of a coarse-fine drive mechanism. A coarse stepping motor imparts rotational motion through a drive gear to a driven shaft, and a fine stepping motor imparts linear or axial motion to the same shaft by means of a cam. The driven shaft is part of a system which integrates the afore-mentioned rotational and axial motions in order to rapidly and accurately move and position a rack through a wide range of drive increments which is afforded by the presence of the coarse and fine drives.

3,662,615

POWER INCREASE ARRANGEMENT

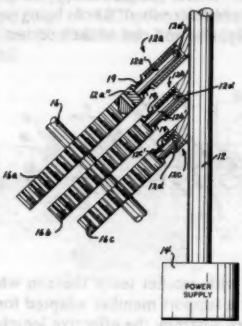
Joseph H. Bethel, 221 E. Missouri St., Evansville, Ind.

Filed July 15, 1970, Ser. No. 55,003

Int. Cl. F16h *1/12*

U.S. Cl. 74—416 **5 Claims**

An arrangement for increasing torque, while operating at the same RPM, characterized by a drive shaft having spokes or arms disposed thereon at an angle with respect to its longitudinal axis, preferably at 45°, which mesh with gears on a



driven shaft for appreciably increasing the power afforded by the driven shaft.

3,662,616

SHOCK ABSORBER MEANS, ESPECIALLY FOR A VEHICLE STEERING COLUMN

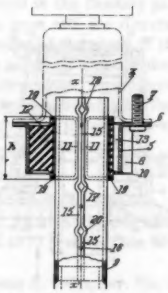
Pierre Jouade, Levallois-Perret, France, assignor to Paulstra, Levallois-Perret, France

Filed June 8, 1970, Ser. No. 44,020

Claims priority, application France, June 13, 1969, 6919825

Int. Cl. B62d *1/18*

U.S. Cl. 74—492 **9 Claims**



To permit axial thrust of the steering column of an automobile from the shock due to an accident, the inner end of the column is constituted by two omega-shaped parts, connected to the steering mechanism through a damping device comprising two semi-circular rubber masses. The masses are precompressed between a continuous outer ring and a central sleeve constituted by two omega-shaped parts clamping between themselves the first said omega-shaped parts. Bulges are provided on the latter to separate the parts of the sleeve and to rub against them after the shock.

3,662,617

REMOTE CONTROL ASSEMBLY

William G. Bennett, Troy, and Donald M. Miller, Pontiac, both of Mich., assignors to Teleflex, Inc., North Wales, Pa.

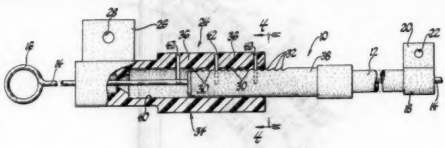
Filed Oct. 8, 1970, Ser. No. 79,195

Int. Cl. F16c *1/14, 1/22*

U.S. Cl. 74—501 R **2 Claims**

A motion transmitting remote control assembly including a conduit and a motion transmitting core element movably

supported by the conduit with the ends thereof extending from the ends of the conduit. Adjustment means is disposed adjacent a first end of the conduit for automatically allowing the conduit to move longitudinally relative thereto in response to a predetermined force being applied thereto. More specifically, the first end of the conduit has a fitting at-



tached thereto with ratchet teeth thereon which coact with ratchet teeth in a support member adapted for attachment to support structure whereby the effective length of the conduit may be adjusted by applying a predetermined force to the core element to in turn adjust the distance the core element extends from the conduit.

3,662,618

INSTRUMENT KNOB HAVING INTEGRAL DETENT MECHANISM AND PANEL MOUNT SOCKET MEANS

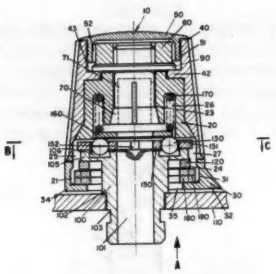
Heinz Ernst Johannes Kroll, Heroldsberg, and Horst Dieter Ziegler, Nurnberg, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 27, 1970, Ser. No. 40,885

Claims priority, application Germany, July 31, 1969, P 19 27 901.7

Int. Cl. G05g *5/06*

U.S. Cl. 74—527 **10 Claims**



A rotary instrument knob with integral detent and stop means. An integral bushing or "termination socket" is provided whereby the knob may be assembled onto a panel in a rotationally predetermined orientation. The detent mechanism includes an indentation contour on a flange end of the termination socket within the knob body. The knob body is constructed in sections whereby the assembly of stop rings, detent balls and spring retaining means may be accomplished and then enclosed within the knob body by snap-fit assembly of the knob body shell over those elements.

3,662,619

FAIL-SAFE ROTARY MACHINE

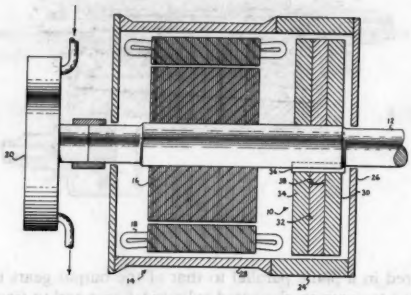
Kurt George Seeliger, Schenectady, N.Y., assignor to General Electric Company

Filed Aug. 26, 1970, Ser. No. 67,181

Int. Cl. F16f *15/30*

U.S. Cl. 74—572 **7 Claims**

This invention relates to a fail-safe rotating machine wherein pre-determined failure locations are designed into the rotating element to assure minimum energy release upon failure of the element due to the centrifugal forces acting thereon. In a specific illustrated embodiment, a cylindrical flywheel mounted upon a motor shaft is formed of juxtaposed discs having diverse tensile strengths to inhibit simultaneous



failure of the discs. Also disclosed are techniques for assuring pre-determined failure locations by fabricating a flywheel of concentric rings having differing thicknesses or by notching the cylindrical surface of a unitary flywheel in a design producing segments of a desired configuration upon failure.

3,662,620

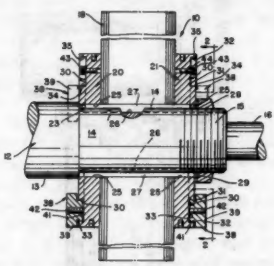
BALANCE ARBOR ASSEMBLY FOR BUFFING AND LIKE MACHINE

George R. Carlson, 830 Cranbrook Road, Birmingham, Mich.

Filed July 2, 1970, Ser. No. 51,985

Int. Cl. F16f *15/32*

U.S. Cl. 74—573 **5 Claims**



A work finishing wheel unit is clamped to a driving arbor by a pair of like holder collars between which conventional buff elements of the unit are held; and these collars each have an annular, dove-tail sectioned groove adjacent the outer periphery thereof. Mating balancing weights, also of dove-tail cross section, have slidable adjustment circumference-wise in the groove, being manually movable annularly to a desired balancing position, then fixedly clamped to the collar by a set screw to serve as a balancing counterpoise.

3,662,621

SPEED RESPONSIVE TRANSMISSION

Koichiro Hirozawa, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Aichi Pref., Japan

Filed May 26, 1970, Ser. No. 40,651

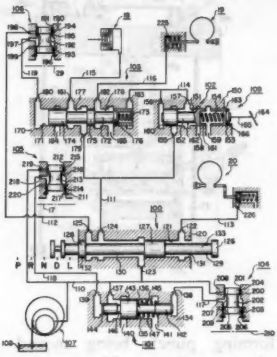
Claims priority, application Japan, May 30, 1969, 44/42840

Int. Cl. F16h *47/08*

U.S. Cl. 74—731 **5 Claims**

This invention relates to improvements in a control mechanism for fluid-operated automatic speed change

mechanisms of an automotive vehicle which comprises a fluid coupling having a pump wheel and a turbine wheel, with an adjusting valve adapted for increasing the hydraulic line pressure in response to a signal from a first sensor sensing an



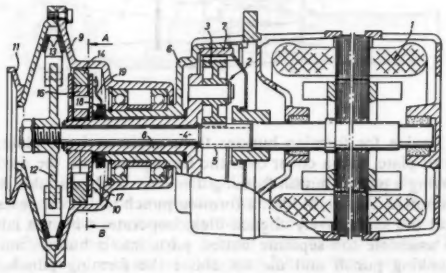
increase in the rotational speed of the pump wheel and adapted for decreasing the hydraulic line pressure in response to a signal from a second sensor adapted for sensing an increase in the rotational speed of the turbine wheel.

3,662,622

DRIVE UNITS FOR AUTOMATIC WASHING MACHINES

Gernot Neumann, Lipperreiche near Bielefeld, Germany, assignor to Hanning Elektro-Werke Robert Hanning, Bielefeld, Germany

Filed Aug. 31, 1970, Ser. No. 68,063
Claims priority, application Germany, Sept. 4, 1969, P 19 44 771.3
Int. Cl. F16h *5/42*; F16d *11/04*
U.S. Cl. 74—752 E **3 Claims**



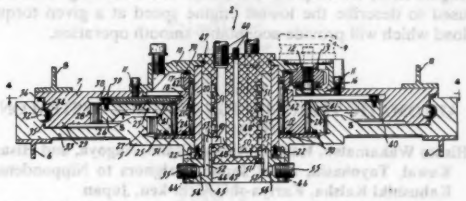
A drive unit for a drum-type automatic washing machine requiring a low speed of rotation for washing and rinsing and higher speeds for spin-drying, the drive unit comprising a drive motor in the form of a pole-changeable electric motor producing at least two speeds of rotation, a motor shaft, a hollow shaft mounted on the motor shaft, a reduction gear arranged to transmit drive from the motor shaft to the hollow shaft, a friction clutch mounted on the hollow shaft and engageable with a clutch casing, a centrifugal clutch mounted on the motor shaft and a drive member secured to the clutch casing, the friction clutch being operative at low speeds and the centrifugal clutch at high speeds of the drive motor to cause rotation of the drive member and the friction clutch comprising a flexible clutch ring having a recess in the form of a heart cam, pressure roller located in the recess and mounted on lateral flanges, the pressure roller being effective to force the clutch ring to engage the clutch casing after a single revolution of the lateral flanges.

3,662,623

TURNTABLE DRIVE MECHANISM

Ervin W. Lorence, Cedarburg, Wis., assignor to Lorence Manufacturing Corp., Milwaukee, Wis.

Filed Aug. 19, 1970, Ser. No. 65,014
Int. Cl. F16h *1/28*; B66c *23/84*
U.S. Cl. 74—805 **14 Claims**



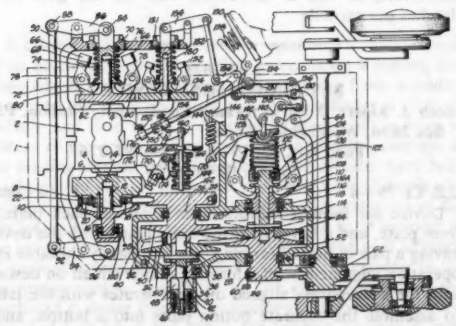
A turntable drive mechanism for heavy construction equipment including a base and a turntable which is mounted for rotation with respect to the base. A motor is mounted on the turntable and drives an eccentric which rotates within an opening in a floating gear unit. The floating gear unit includes a lower small diameter gear and an upper large diameter gear, with the small gear being engaged with a gear ring connected to the base, while the large gear is engaged with a gear ring connected to the turntable. Each gear has a lesser number of teeth than the corresponding gear ring and rotation of the gear unit provides a speed reduction to the turntable. The gear ring associated with the turntable is journalled within and upstanding peripheral flange formed on the base. The space between the turntable and the base serves as an oil reservoir, and to provide more effective lubrication, a series of passages are formed in the floating gear unit adjacent the teeth of the smaller gear and are directed toward the input drive gear. Engagement of the teeth of the smaller gear with the gear ring acts to pump oil through the passages and direct the oil toward the drive gear. An improved swivel coupling connection is provided for connecting the power lines on the rotating turntable to the power lines on the non-rotating base.

3,662,624

VEHICLE TRANSMISSION CONTROL

Lloyd H. Leonard, 14877 Valley Vista Blvd., Sherman Oaks, Calif.

Filed June 5, 1970, Ser. No. 43,819
Int. Cl. B60k *21/00*
U.S. Cl. 74—865 **10 Claims**



An internal combustion engine control system including a continuously variable speed transmission at its lowest ratio when it rests, and increasing in ratio responsive to increases

in transmission output, transmission output speed responsive means to adjust transmission ratios at a fixed throttle setting, the entire relationship between transmission output speed, the means responsive thereto to vary the transmission ratio and the throttle setting being such as to cause the engine to "lug" continuously at relatively low engine speeds in comparison with the normal currently recommended and used engine RPM vs. torque relationship. The term "lug" is herein used to describe the lowest engine speed at a given torque load which will provide acceptably smooth operation.

3,662,625

AUTOMATIC TRANSMISSION CONTROL SYSTEM ON AUTOMOBILES

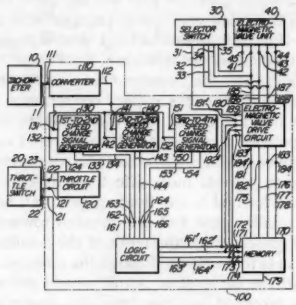
Hisato Wakamatsu, Kariya; Akira Kitano, Nagoya, and Hisasi Kawai, Toyohashi, all of Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Continuation-in-part of application Ser. No. 34,098, May 4, 1970. This application May 7, 1970, Ser. No. 35,327

Claims priority, application Japan, May 9, 1969, 44/35864

Int. Cl. B60k *21/00*

U.S. Cl. 74—866 **5 Claims**



An automatic transmission control system of automobiles, wherein the coupling of a gear of the multiposition shifting mechanism and a gear meshing therewith on the engine side is released when a speed change signal is sent out, thereby placing the gears in neutral for a predetermined time interval until the specified change gear is meshed by the fluid coupling with the engine side gear, so as to eliminate shocks otherwise experienced by the automobile at the time of gear shifting to prevent people on the automobile from feeling discomfort, as well as to reduce wear on the gear mesh clutches per car-mile.

3,662,626

BUTTON-FORMING DEVICE

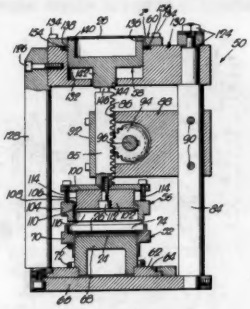
Jacob J. Alpert, 3 Burnt Swamp Road, Amity Station, P.O. Box 3896, Woodbridge, Conn.

Filed Nov. 23, 1970, Ser. No. 91,876

Int. Cl. B29d *19/00*

U.S. Cl. 79—4 **6 Claims**

Device for forming buttons from a pin-on back plate, a front plate, and a cover over the front plate, with the device having a pair of button-forming dies alternately shiftable into operation alignment with a forming punch which on descent with the successively aligned dies cooperates with the latter to assemble the separate button parts into a button, and a cover-blanking punch and die set above the forming punch, of which the blanking die is topmost and has a die aperture open at the top and bottom and a cutting edge at the bottom of the aperture, with the blanking die being by the forming punch raised into blanking cooperation with the blanking die,



and the forming punch being moved upwardly and downwardly by manually operable means.

3,662,627

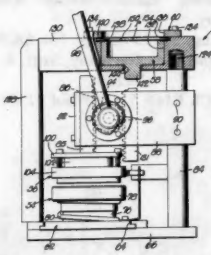
BUTTON-FORMING DEVICE

Walter Spruegel, New Haven, Conn., assignor to Jacob J. Alpert, Woodbridge, Conn.

Filed Jan. 4, 1971, Ser. No. 103,747

Int. Cl. B29d *19/00*

U.S. Cl. 79—4 **2 Claims**



Device for forming buttons from a pin-on back plate, a front plate, and a cover over the front plate, with the device having a pair of button-forming dies alternately shiftable into operative alignment with a forming punch which on descent into the successively aligned dies cooperates with the latter to assemble the separate button parts into a button, and a blanking punch and die set above the forming punch, of which the blanking punch is raised into cooperation with the blanking die for blanking a cover from a supply sheet, and a handlever operatively connected with the punches for simultaneously lowering the forming punch and raising the blanking punch.

3,662,628

TORQUE RELEASE ADAPTER

Lawrence S. Schnepel, 250 Goodman Hill Road, Sudbury, Mass.

Continuation-in-part of application Ser. No. 860,231, Sept. 23, 1969, now abandoned. This application Apr. 20, 1970, Ser. No. 30,043

Int. Cl. B25b

U.S. Cl. 81—52.4 **10 Claims**

A torque release adapter comprising a receptacle and rigid plate rotatably mounted therein with confronting surfaces

normal to the axis of rotation, said surfaces containing recesses in which are mounted bearing members, and means for yieldably applying pressure to the parts to constrain the bearings to said recesses to transmit torque from one part to the other, said yieldable means being yieldable to a torque in

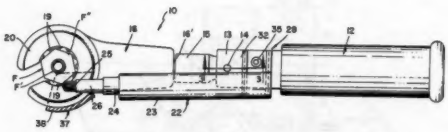
excess of a predetermined adjustable amount to permit the parts to separate so that one part rides over the bearing members relative to the other part a distance corresponding to the distance between recesses and then become re-engaged with the bearing members.

3,662,629

COMBINED WRENCH AND MARKING DEVICE

Christopher James Lance, Royal Oak, Mich., assignor to Ivan F. Belknap, Detroit, Mich., a part interest

Filed July 13, 1970, Ser. No. 54,466
Int. Cl. B25b
U.S. Cl. 81—52.4 **10 Claims**



A marking wrench for hand use has a torque-limiting, over-center type of connection between an operating handle and a remote wrench end pivoted to the handle and engageable with the bolt end of a tubular type headed fitting. The handle fixedly mounts an elongated felt marking pen, whose tip is positioned to one side of the tubular shank of the fitting, in axially spaced relation to the plane of the fitting's hex head. Hence when a desired torquing stress is attained and the torque-limiting connection yields the marking tip wipes across the shank beneath the fitting's head, thus marking the fitting as being properly torqued up. An arcuate shield is applied to the wrench end in the plane of the marking tip.

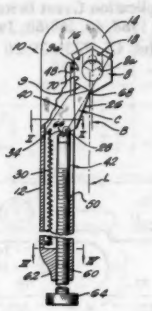
3,662,630

ADJUSTABLE RATCHET WRENCH

John C. Baxter, 3033 Mary S.E., Grand Rapids, Mich.

Filed Sept. 29, 1969, Ser. No. 861,865
Int. Cl. B25b *13/28*
U.S. Cl. 81—97 **7 Claims**

An adjustable ratchet wrench of the open-face type, a movable jaw and at least two fixed gripping surfaces. The movable jaw is adjustable toward and away from the fixed jaw's two gripping surfaces along a line parallel to the bisector of the angle formed by the surfaces. The movable jaw is pivoted to give the ratcheting function.

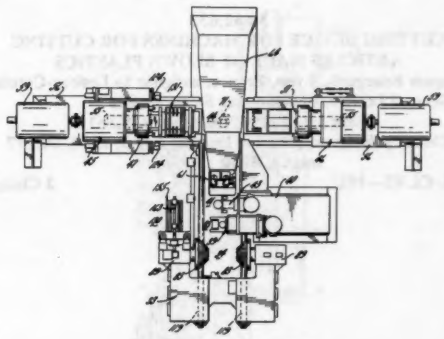


3,662,631

APPARATUS FOR TRANSFERRING AND MACHINING WORKPIECES

Hans J. Baechle, and James O. Holtey, both of Rockford, Ill., assignors to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed Aug. 12, 1970, Ser. No. 63,087
Int. Cl. B23b *15/00*
U.S. Cl. 82—2.5 **17 Claims**



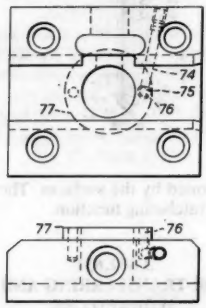
A cylinder whose ends are to be machined is first centered in an accurately located position by cones on a loading carriage which thereafter advances the cylinder from a loading station to a machining station where the cylinder is clamped radially and held in its accurately located position prior to release of the cones and retraction of the loading carriage to the loading station. After the ends of the cylinder have been machined by cutters supported on a pair of tool heads, the cylinder is unclamped and is transferred laterally out of the machining station with one of the tool heads as an incident to the normal retraction of such head. During the next advance of the loading carriage to deliver a succeeding cylinder to the machining station, a fork lift on the carriage picks up the machined cylinder from its transferred position adjacent the retracted tool head and, when the loading carriage is subsequently retracted, carries the machined cylinder back to an unloading station adjacent the loading station.

3,662,632

RELATING TO MACHINE TOOLS

Raymond A. Riley, Bulkington, near Nuneaton, England, assignor to The Dunlop Company Limited, London, England

Filed May 14, 1969, Ser. No. 824,533
Claims priority, application Great Britain, May 17, 1968, 23,520/68; Sept. 18, 1968, 44, 260/68; Jan. 11, 1969, 1,786/69
Int. Cl. B23b *29/20*
U.S. Cl. 82—36 2 Claims



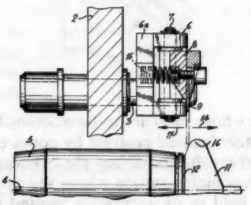
In a machine-tool arranged to accept pre-set tools, a tool carrier on which the pre-set tools are detachably mounted. The tool carrier is arranged to be adjustably located on a tool support structure so as to permit alignment, and re-alignment after wear has taken place, of the carrier with the spindle axis of the machine-tool, of which the following is a specification.

3,662,633

CUTTING DEVICE FOR MACHINES FOR CUTTING ARTICLES MADE OF BLOWN PLASTICS

Jacques Bourgeois, Lyon, France, assignor to Lesieur-Cotelle, General Leclerc, Boulogne sur Seine, France

Filed July 1, 1969, Ser. No. 838,361
Claims priority, application France, July 3, 1968, 50,177
Int. Cl. B23b *3/04, 5/14*
U.S. Cl. 82—101 2 Claims



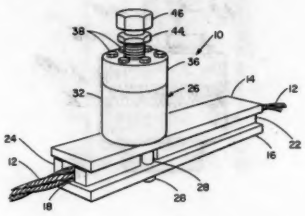
A plastic article is rotated about an axis of rotation and a cutting blade mounted on a pivotal arm is moved towards the rotating article proximate a groove therein where the article is to be cut. The arm is resiliently supported to permit transverse movement therein parallel to the axis of rotation and when the blade is lowered against the article, it rides along an inclined surface adjacent the groove so as to be guided into the groove to effect the removable of the undesired waste on the article beyond the groove.

3,662,634

HYDROSTATICALLY POWERED MESSENGER STYLE WIRE CUTTER

John C. Burke, North Falmouth, Mass., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 18, 1970, Ser. No. 99,381
Int. Cl. B26d *5/12*
U.S. Cl. 83—1 4 Claims



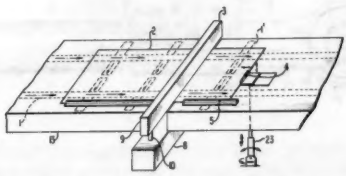
A hydrostatically actuated messenger type wire cutter for severing wire below the surface of a body of water consisting of a slide having an assembly for actuating a cutting tool to sever or weaken the wire at a preselected depth. A rupture disk collapses at the preselected depth, permitting water pressure to react against a piston carrying the cutting edge.

3,662,635

ELECTROMAGNETIC INDUCTION TYPE FEEDING AND POSITIONING METHOD AND APPARATUS FOR METAL PLATES

Yukio Yabuta, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 24, 1970, Ser. No. 22,297
Claims priority, application Japan, Mar. 25, 1969, 44/22616
Int. Cl. B65h *5/00, 9/06*
U.S. Cl. 83—23 14 Claims



A metal plate to be processed is supplied to, positioned in and removed from a processing machine by electromagnetic induction feeding and positioning apparatus. The feeding and positioning units comprise electromagnets which are disposed under a table on which the metal plate is fed, and adjustable stopper and guide means are provided on the table to properly position the metal plate at a work station.

3,662,636

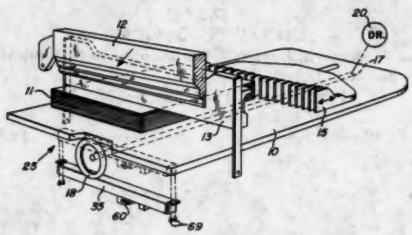
MATERIAL CUTTER CONTROL APPARATUS

Dorse James Young, Centerville, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed June 12, 1970, Ser. No. 45,702
Int. Cl. B26d *1/08, 5/36*; G11b *31/00*
U.S. Cl. 83—71 4 Claims

A material cutting apparatus includes a modular, replaceable control assembly for positioning a movable machine element, such as a backgauge, on the material cutter by controlling the element drive means. The control assembly includes a continuous magnetic tape which moves in response to the movement of the machine element past magnetic

recording and/or playback heads. The magnetic tape is contained within a housing and supported for movement therein on a pair of rollers. The housing also contains recording and/or playback heads and means for indexing these heads relative to the tape to define a plurality of job programs on the tape. The housing is removably attached to the machine, preferably within easy access of the operator, and a mechanical connection is made by a chain between the magnetic tape and the machine element for moving the tape through a distance proportional to the movement of the machine element. An electrical connection is also made between the magnetic heads and the drive means for controlling the movement of the machine element in accordance with control signals on the magnetic tape.



3,662,637

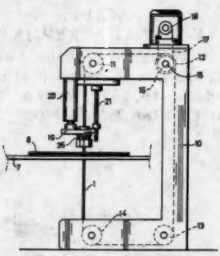
DEVICE FOR CUTTING PLATE MATERIAL

Hendrik Glastra, Enschede, Netherlands, assignor to N.V. Maatschappij voor Industriele Research en Ontwikkeling, Enschede, Netherlands

Filed Mar. 19, 1970, Ser. No. 20,980

Int. Cl. B23d *55/08*

U.S. Cl. 83—201.15 **8 Claims**



Cutting machine for plate material with a loop of cutting wire, which is driven in the circumferential direction, and has a cross-section which is substantially equilaterally triangular, while furthermore suitable drive means impart to the wire a movement around its center line.

3,662,638

SHEARLINE FOR TRIMMING PLATES AND SHEETS, IN PARTICULAR HEAVY PLATES, BY MEANS OF CIRCULAR CUTTER MEANS

Gunter Karl Fries, Neunkirchen (Saar), and Berthold Jakob Marx, Rohrbach (Saar), both of Germany, assignors to Moeller and neumann GmbH, Ingbert (Saar), Germany

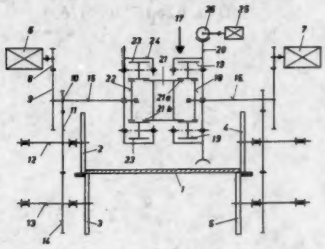
Filed Jan. 19, 1970, Ser. No. 3,651

Claims priority, application Germany, Jan. 24, 1969, P 19 03 488.9

Int. Cl. B23d *19/06*

U.S. Cl. 83—367 **6 Claims**

In a shears line for trimming sheets or plates by means of two oppositely disposed circular cutter shears, variable gear means are provided for varying the rotary speed of the one circular cutter pair relatively to the other circular cutter pair, thereby to obtain a straight line delivery of the trimmed sheets or plates. The variable gear means may be controlled manually or automatically.



3,662,639

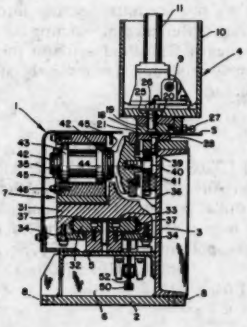
SHEARING APPARATUS

Donald J. Wheeler, Kent, and William Adie, Solon, both of Ohio, assignors to Roller Shear Corporation, Bedford, Ohio

Filed Apr. 17, 1970, Ser. No. 29,488

Int. Cl. B26d *7/02*

U.S. Cl. 83—456 **16 Claims**

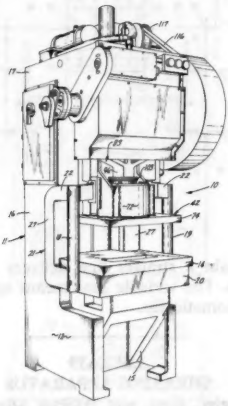


Shearing apparatus comprises a vertically movable shear assembly for releasably clamping the strip material during shearing, and a transversely movable shear assembly which cooperates with the vertically movable shear assembly to shear the strip material during traversal across the strip. A cam roll track may be provided for supporting one end of the mounting shaft for the transversely movable shear assembly during traversal across the strip material to take the load off the shaft, and electromagnets may also be provided to resist bowing of the rectangular shear blade for the vertically movable shear assembly resulting from separation forces created during shearing without having to provide a large superstructure therefor. The support for the transversely movable shear assembly may be mounted for pivotal movement to permit adjustment of the vertical clearance or overlap between both shear blades, and provision may also be made for adjusting the axial or lateral clearance between such shear blades.

3,662,640
MACHINE TOOL

Theodore J. Wrona, Sturgis, Mich., assignor to Press Systems, Inc., Sturgis, Mich.

Filed Oct. 9, 1969, Ser. No. 865,095
Int. Cl. B26d *7/26, 5/16*
U.S. Cl. 83—530 **7 Claims**

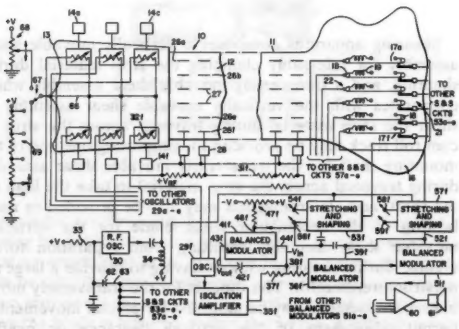


A press having a C-shaped frame including a die support surface and slide means for moving a punch toward and away from the support surface. A Y-shaped pitman has upwardly extending arms eccentrically mounted upon shaft means for effecting vertical reciprocation of the stem at the lower end of the pitman which is pivotally connected through a pressure fluid actuator to the slide means. Thus, vertical movement of the slide means relative to the support surface can be effected both by the eccentrics acting through the pitman and by the pressure fluid actuator acting between the pitman and the slide means. The fluid actuator includes means for making extremely small adjustments in the stroke of the pressure fluid actuator.

3,662,641
ELECTRONIC MUSICAL APPARATUS

Joseph Stevens Allen, 202 Valparaiso, Atherton, Calif., and Zeb Vance Bulla, Jr., 4018 C Woodmont, Nashville, Tenn.

Continuation-in-part of application Ser. No. 864,024, Oct. 6, 1969. This application Oct. 1, 1970, Ser. No. 77,280
Int. Cl. G01h *1/00*
U.S. Cl. 84—1.01 **32 Claims**



An electronic musical instrument in which the fingerboard of a guitar is replaced by capacitive touch contact switches simulating all of the fret positions of a string. The touch plates are coupled to various oscillators and the output frequency is amplitude modulated by a transducer produced output signal from a set of strings which are plucked. This output signal is stretched and shaped as desired to modulate the audio frequency signal and produce the final musical output.

3,662,642
RETAINING DEVICES

James A. Bernard, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

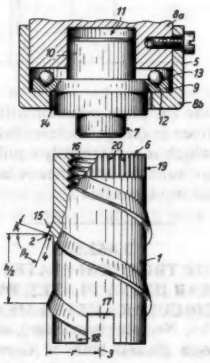
Filed May 18, 1970, Ser. No. 38,170
Int. Cl. F16b *21/18*
U.S. Cl. 85—8.8 **3 Claims**

A retaining device for presenting actual displacement of parts or elements concentrically arranged with respect to one another wherein the retaining device in the form of a split ring, substantially U-shaped in cross section, is provided with an annular split collar or web portion and radially extending split spring rings adapted to be seated in grooves provided in the elements to be held together, one of the spring rings having at least a portion of it bent toward the adjacent spring ring to provide a biasing force when the retaining device is placed in position to hold the two elements together.

3,662,643
SELF-TAPPING SCREW INSERT

Harry Scheffer, Brachwede/Westphalia, Germany, assignor to Bollhoff & Co., Brackwede, Westphalia County, Germany

Filed May 15, 1970, Ser. No. 37,662
Int. Cl. F16b *25/00, 35/00, 39/30*
U.S. Cl. 85—46 **11 Claims**



This invention relates to a screw threaded insert or member cutting its own thread in a workpiece, adapted to be fitted in a workpiece of soft material, such as for instance aluminum, plastics, wood, or the like, wherein the thread has flanks differentially inclined relative to a plane normal to the axis of the thread at angles predetermined in accordance

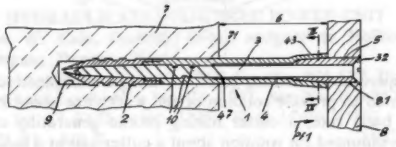
with specific mathematical relationships so as to be self-locking against rotation due to axial loading of the insert in the direction of pull-out while permitting installation of the insert under axial loading in the opposite direction.

3,662,644

WALL PLUG ASSEMBLY, PARTICULARLY FOR AFFIXING FACINGS

Friedrich Flesch, Emmendingen, and Hansjorg List, Waldkirch, both of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed June 30, 1970, Ser. No. 51,182
Claims priority, application Germany, July 1, 1969, P 19 33 313.2
Int. Cl. F16b *13/06*
U.S. Cl. 85—69 **6 Claims**



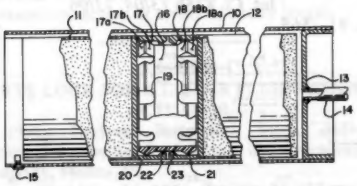
A wall plug assembly, particularly for affixing facings, comprising the actual "dowel" or plug itself, a securing screw, an extension shank and an expanding sleeve for the latter. The plug, in a zone not capable of being expanded, and/or in the extension shank are respectively is provided with at least one thrust bearing for the purpose of fixing the securing screw in its axial position.

3,662,645

COUPLER FOR INTERCONNECTION OF TANDEM LAUNCHED AERIAL FLARES

James R. Thurston, Brigham City, and Roger A. Grosgebauer, Ogden, both of Utah, assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Mar. 9, 1970, Ser. No. 17,555
Int. Cl. B64d *1/04*
U.S. Cl. 89—1.5 R **5 Claims**



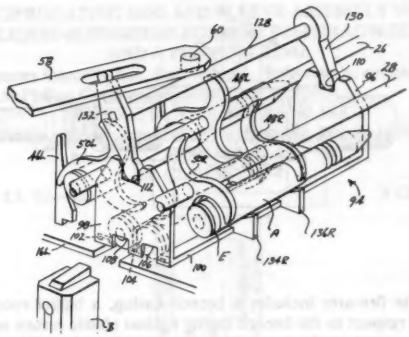
A coupler is provided for interconnecting two aerial flares prior to and during the early stages of their launching from an aircraft in order to prevent erratic tumbling of the flares which could result in striking of the flares on some part of the aircraft. The flares stay coupled only until they are clear of the aircraft and are then pulled apart by the air turbulence in the wake of the aircraft. The coupler is formed of semi-resilient plastic and is installed in place in each flare prior to launch.

3,662,646

FEEDER

John F. O'Brien, and Herve J. Ouellette, both of Springfield, Mass., assignors to General Electric Company

Filed Oct. 24, 1969, Ser. No. 869,148
Int. Cl. F41d *9/02*
U.S. Cl. 89—33 SF **10 Claims**



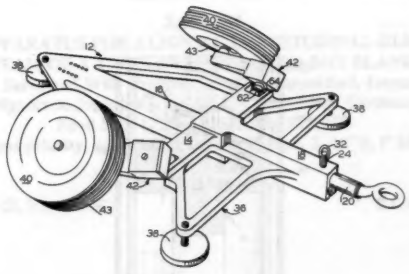
An ammunition feeder for a machinegun has two sets of infeed sprockets which alternatively feed rounds to a shiftable tray having two alternative stripping stations, either of which may be alternatively disposed to cooperate with the bolt.

3,662,647

QUICK EMPLACEMENT GUN CARRIAGE MECHANISM

Leonard L. King, Rock Island, Ill., assignor to The United States of America as represented by the Secretary of the Army

Filed Nov. 19, 1970, Ser. No. 90,979
Int. Cl. F41f *23/20*
U.S. Cl. 89—40 J **15 Claims**



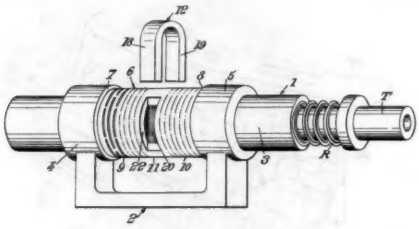
In order to convert a wheeled gun carriage between fixed emplacement thereof and a mobile towing position, each wheel is mounted to one end of a support arm which is, in turn, angularly pivoted to the side of the gun-support frame in geared connection with a rotatable shaft extending transversely through the frame in position to be rotated by movement of the vehicle utilized to tow the carriage whereby back-up movement of the towing vehicle actuates the support arms to tilt the wheels outwardly of the frame to effect the lowering thereof into fixed emplacement on the ground and whereby subsequent forward movement of the towing vehicle actuates the support arms to return the wheels to the vertical position required to permit the normal towing of the carriage.

3,662,648

ELASTIC DAMPING DEVICE FOR FIRE-ARMS

Bernard Maillard, Geneva, Switzerland, assignor to Brevets Aero-Mecaniques S.A., Geneva, Switzerland

Filed Mar. 4, 1970, Ser. No. 16,409
Claims priority, application Switzerland, Mar. 5, 1969, 58,147
Int. Cl. F41f *19/06*
U.S. Cl. 89—44 7 Claims



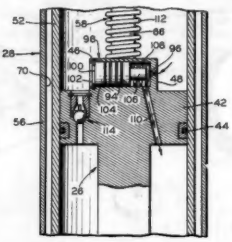
The fire-arm includes a breech casing, a barrel recoiling with respect to the breech casing against elastic return means and a rigid support on which the breech casing slides. The elastic damping device interposed between the breech casing and the rigid support is an elastic cylindrical sleeve inserted between the two axial stop surfaces. The cylindrical sleeve has two elastic end zones separated by a rigid zone. The rigid support has two cylindrical co-axial rings axially separated. Yokes are used as removable fixing means for a cylindrical collar to the rigid zone. The weapon can be a fixed or movable installation.

3,662,649

SELF-LOCKING HYDRAULIC LINKAGE

Jimmy H. Williams, Bettendorf, Iowa, assignor to The United States of America as represented by the Secretary of the Army

Filed Mar. 23, 1970, Ser. No. 21,575
Int. Cl. F41f *23/34*
U.S. Cl. 89—40 J 11 Claims



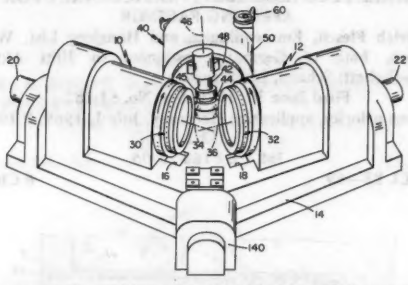
A self-locking hydraulic piston and cylinder arrangement interposed between a stationary and a movable member is provided with a slidable poppet valve in the heat of the piston. The valve is normally spring biased to a fully open position to permit a slightly restricted passage of hydraulic fluid through the piston head during the movement of the pivotal member relative to the stationary member. However, when the poppet valve is subjected to a differential pressure in excess of the spring bias thereagainst, it is automatically actuated to block the passage of the hydraulic fluid through the piston heat thereby preventing further relative movement between the piston and cylinder which then acts as a rigid link between the movable and stationary members.

3,662,650

GEAR MAKING

Paul Maker, Marion, Mass., assignor to Bird Island, Inc., Boston, Mass.

Filed Feb. 16, 1970, Ser. No. 11,503
Int. Cl. B23f *5/20*
U.S. Cl. 90—3 15 Claims



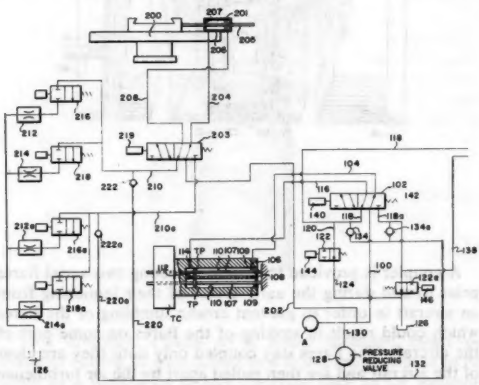
Apparatus for making gears, featuring a workpiece support mounted to provide rotation of the workpiece about its axis at a basic rate; a cutter having profile generating cutting edges mounted for rotation about a cutter axis at a basic rate bearing a ratio to the basic workpiece rate dependent upon the ratio of the number of profiles being generated to the number of profile generating cutting edges in the cutter, the cutter axis being at an angle to the workpiece axis which differs from 90° by an angle other than the helix angle (taken at the generating circle) of the gear being made, the cutter and workpiece being mounted for relative translation axially of the workpiece; and an element responsive to that relative translation to add to or subtract from the basic workpiece rate a rate of rotation to which the rate of translation bears a ratio equal to the desired lead of the gear being made; whereby successive cuts made in each toothspace are tangent to the adjacent profile at lines oblique to the workpiece axis and extending generally between the fillet and tip of the profile, and between successive cuts tangent to any one desired profile there will intervene a complete revolution of the workpiece.

3,662,651

HYDRAULIC SYSTEM FOR LIMITING DEFLECTION OF A PISTON STOP

Henry L. Cunningham, Horseheads, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Dec. 17, 1969, Ser. No. 885,891
Int. Cl. F15b *13/04*, *13/06*
U.S. Cl. 91—165 4 Claims



This invention relates to a hydraulic system for machine tool operation which limits deflection of a stop at the end of

machine tool travel. The hydraulic system includes a cylinder, a piston, a fluid line connected to one end of the cylinder, with the fluid lines being alternately pressure and exhaust lines. Fluid under pressure is introduced alternately in one of the fluid lines for moving either a piston or a cylinder housing relative to the piston and a means for reversing fluid flow in the lines acts to move either the piston or cylinder housing back and forth. Maximum flow pressure is maintained in one of the fluid lines when used as a pressure line, and a minimum fluid pressure is maintained in one of the fluid lines when used as an exhaust line. The cylinder housing includes a stop whereby said minimum fluid pressure on one side of the piston acts against the maximum fluid pressure on the other side of the piston for limiting deflection of the stop.

3,662,652

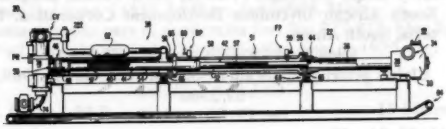
HYDRAULICALLY POWERED POWER UNIT

Clinton W. Cole, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Original application Dec. 19, 1969, Ser. No. 886,687. Divided and this application Jan. 21, 1971, Ser. No. 108,382

Int. Cl. F15b *11/00, 13/00;* **F04b** *17/00, 35/00*

U.S. Cl. 91—411 R **18 Claims**



An hydraulically powered multiplex pump having at least three pumping units, each operable in a cycle including suction, precompression and discharge phases, with the cycles being out of phase with one another, whereby simultaneous performance of these functions results in a substantially constant pressure and flow of both the pumped fluid and the power fluid. Separate power and cycle control circuits, which may employ different fluids, are provided. Control valve assemblies, each including two sleeve valves communicating with a common chamber, are operated by the control circuit fluid to condition power circuit flow for the various phases of the pumping cycle. The power end of the pumping units includes power cylinders which may be fluid interconnected at their rod ends so that operations in each power cylinder affect functions in the other chambers, and provision is made for automatic correction of errors in stroke length.

3,662,653

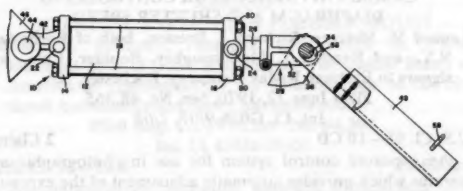
SAFETY LOCK FOR A LINEAR FLUID PRESSURE ACTUATOR

Robert Philip Carlson, Bettendorf, Iowa, and George Frederick Oelschlaeger, Rock Island, Ill., assignors to Deere & Company, Moline, Ill.

Filed Mar. 26, 1970, Ser. No. 22,922

Int. Cl. F15b *15/26*

U.S. Cl. 92—15 **4 Claims**



A rigid, elongated spacer of generally U-shaped cross-section adapted to fit over the extended piston rod of a hydraulic ram and having opposite ends engageable with the cylinder body and outer end of the rod, respectively, to prevent retraction of the latter. The spacer is pivotally mounted on the outer end of the rod for swinging movement between its operative position and an inoperative position. A removable pin acts to releasably maintain the spacer in the former position.

3,662,654

RECIPROCATING ROD AND SLEEVE ASSEMBLY WITH A LIQUID-SUPPORTED ROLLING DIAPHRAGM SEAL AND A PUMPING RING

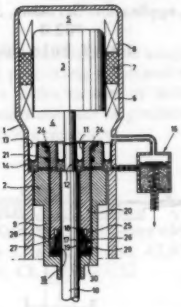
Johannes Cornelis Bax, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 14, 1970, Ser. No. 97,585

Claims priority, application Netherlands, Jan. 8, 1970, 7000189

Int. Cl. F15b *21/04*

U.S. Cl. 92—83 **5 Claims**



A device including a reciprocally moving piston and cylinder pair with a rolling-diaphragm seal secured between them and axially spaced therefrom a pumping ring disposed in an annular space between the piston and cylinder; also in this annular space intermediate the seal and pumping ring is a sleeve secured to the cylinder and releasably engagable to the ring, as part of a mounting assembly for the pumping ring.

3,662,655

APPARATUS FOR ALIGNING LONGITUDINAL GLUE SEAM OF A TUBULAR CARDBOARD BOX BLANK

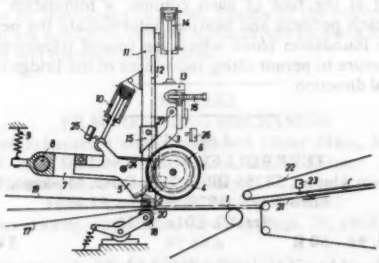
Karl Saro, and Willi Trosdorff, both of Dusseldorf, Germany, assignors to Jagenborg-Werke AG, Dusseldorf, Germany

Filed Feb. 17, 1971, Ser. No. 115,949

Claims priority, application Germany, Mar. 2, 1970, P 20 09 608.6

Int. Cl. B31b *1/00*

U.S. Cl. 93—36 SQ **9 Claims**



An apparatus for the alignment of two portions of a cardboard tube made from a box blank, which portions are joined by a longitudinal glue seam, comprising an endless belt having a run resiliently urged upwards below a stop which is en-

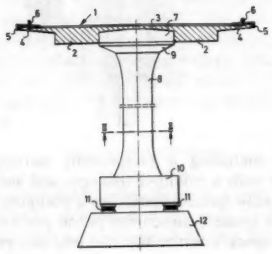
gaged by the box blank. Means actuated by the movement of a box blank past a sensing station intermittently actuates a pair of spaced rollers which help align the blank against the stop and intermittently actuates a vertically displaceable lever which moves down, engages the blank and forces it down together with the belt therebelow against the upward resilient urging on the belt. This moves the blank below the stop so that it can be advanced by the belt.

3,662,656

MULTI-SECTION BRIDGE SUPPORTING STRUCTURE OF STEEL OR REINFORCED CONCRETE HAVING SUPPORTS CENTRALLY OF THE CROSS-SECTION OF THE STRUCTURE

Ulrich Finsterwalder, Munich-Obermenzing, and Klemens Finsterwalder, Socking, both of Germany, assignors to Dyckerhoff & Widmann Kommanditgesellschaft, Munich, Germany

Filed June 12, 1970, Ser. No. 45,839
Claims priority, application Germany, June 11, 1969, P 19 29 702.0
Int. Cl. E01c *1/00*
U.S. Cl. 94—1 **5 Claims**



Bridge or highway supporting structure of steel concrete or prestressed concrete for multiple section structure with columns disposed centrally of the cross-section of the bridge, a superstructure of beams in the form of slabs rigidly connected to the columns with at least one slab-shaped longitudinal girder and slab-shaped transverse beams of the same structural height as the longitudinal girders where the columns are slender in the direction longitudinally of the bridge supporting structure and relatively wider transversely thereof and connected with the transverse beams with a pedestal at the foot of each column, a foundation block below each pedestal and bearings intermediate the pedestal and the foundation block which are spaced transversely of the structure to permit tilting movement of the bridge in longitudinal direction.

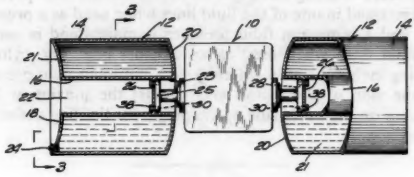
3,662,657

TURF ROLLER FOR TRACTOR

Francesco Aiuppa, 58286 Hill & Dale Drive, Muskego, Wis.

Filed July 9, 1970, Ser. No. 53,403
Int. Cl. E01c *19/26*
U.S. Cl. 94—50 R **3 Claims**

Disclosed herein is a turf roller adapted to be connected to the wheel hub of a vehicle such as a tractor and used as both a driving wheel and a roller. The roller includes inner and outer concentric cylindrical walls and end walls which connect the outer and inner walls to define a concentric water chamber and an axial passage adapted to receive the wheel hub of a vehicle. A bracket or partition located in the axial passage and spaced intermediate its length is provided with a



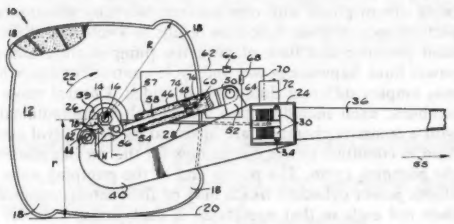
plurality of apertures for receiving the hub studs. Nuts are threaded on the studs to secure the partition to the hub. Access to the nuts is afforded by the axial passage.

3,662,658

IMPACT COMPACTION OF LOOSE MATERIALS

Aubrey Ralph Berrange, Pretoria, South Africa, assignor to South African Inventions Development Corporation, Pretoria, South Africa

Filed Mar. 19, 1970, Ser. No. 21,016
Claims priority, application South Africa, Apr. 2, 1969, 69/2360
Int. Cl. E01c *19/30*
U.S. Cl. 94—48 **16 Claims**



The specification discloses an impact roller which is attachable to a hauling vehicle via a drawbar and a resilient coupling and which includes restraining means, for example in the form of damping means or braking means, to restrain excessive relative horizontal movement between the roller and the drawbar during hauling of the roller.

3,662,659

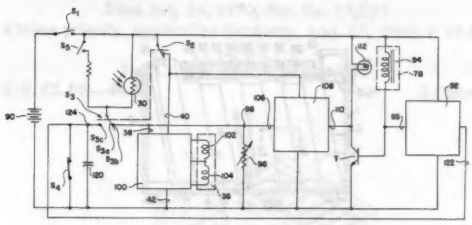
CAMERA APPARATUS FOR CONTROLLING DIAPHRAGM AND SHUTTER SPEED

Lenard M. Metzger; Richard J. Bresson, both of Rochester, N.Y., and Randall T. McConaughey, Boulder, Colo., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 22, 1970, Ser. No. 48,365
Int. Cl. G03b *9/07, 7/08*
U.S. Cl. 95—10 CD **2 Claims**

An exposure control system for use in photographic apparatus which provides automatic adjustment of the exposure aperture in response to a signal from a photoresponsive member and then actuates a shutter mechanism to make an exposure for an interval determined by a timing circuit as a

function of the aperture adjustment and the signal from the photoresponsive member. Preferably, the system includes in-



dicator means controlled by the photoresponsive member to provide an indication of low light conditions and of the termination of the exposure interval.

3,662,660

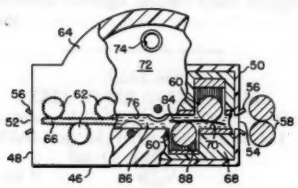
APPARATUS FOR PROCESSING SENSITIZED MATERIAL

Ronald P. Layne, 15598 Addison, Southfield, Mich.

Continuation-in-part of application Ser. No. 727,821, May 9, 1968, now abandoned. This application Aug. 5, 1970, Ser. No. 61,181

Int. Cl. G03d *3/06*

U.S. Cl. 95—89 R **15 Claims**



Apparatus for processing sensitized material such as X-ray film and the like which automatically transports the film through successive processing stages such as developing, fixing, washing and drying. No external connection to water sources or drains are required. The film is oriented in a vertical plane as it passes through the processing stages and the chemical solutions flow downwardly by gravity between wetted surfaces with the surfaces acting to confine the downwardly moving stream so that seals at the film inlet and outlet of the apparatus are not required. The film is passed through the downwardly moving stream of chemical solution which assures constant supply of fresh solution and continuous drainage of the by-products of the chemical reaction.

3,662,661

SCIENTIFIC EXPERIMENT FLEXIBLE MOUNT

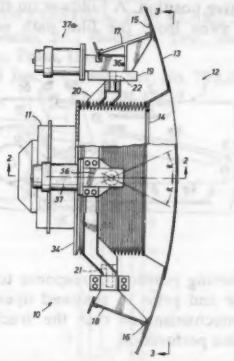
Horace E. Whitacre, Pasadena, and Arthur R. White, Houston, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Aug. 17, 1970, Ser. No. 64,391

Int. Cl. G03b *29/00*

U.S. Cl. 95—12.5 **10 Claims**

An apparatus for mounting scientific experiments in a spacecraft which permits their utilization without maneuvering of the spacecraft. One end of an elongated flexible bellows is hermetically attached to the framework of the spacecraft in an encircling relationship about an opening. The other end is sealed over with an adapter plate to permit interconnection of a camera, optical system, sextant, or other



equipment. A gimbal system attaches the adaptor plate to the frame of the spacecraft permitting rotational movement on a pair of orthogonal axes. Drive motors or hand operated adjusting means interconnect the pair of gimbals for controlled movement of the scientific experiment.

3,662,662

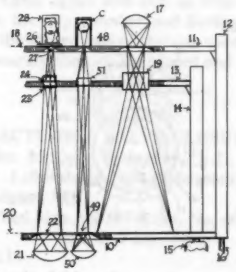
FOCUS SENSOR

Leon Dewan, 16 West End Ave., Old Greenwich, Conn.

Filed June 3, 1970, Ser. No. 42,939

Int. Cl. G03b *27/52*

U.S. Cl. 95—44 A **4 Claims**



Apparatus for sensing and automatically adjusting the focus of a photographic variable size copying machine.

An optical system identical to that of the camera is mechanically coupled to operate in parallel therewith. A photoelectric sensing system located in the plane of the photographic plate receiving light through the optical system from a light source in the plane of the negative carrier is activated by inaccuracy of focus. Signals of the photoelectric system are applied to control motor driven focusing means to restore and maintain sharp focus.

3,662,663

FILM METERING MECHANISM

Richard Schmierl, Unterhaching, and Dieter Maas, Munich, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 26, 1969, Ser. No. 861,281

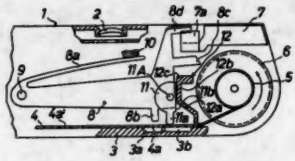
Claims priority, application Germany, Sept. 28, 1968, P 17 97 44.6

Int. Cl. G03b *1/62, 17/42*

U.S. Cl. 95—31 FM **8 Claims**

A still camera for use with roll film of the type having a row of perforations, one for each film frame, wherein the housing accommodates a lever biased from a starting to an

operative position in which the lever prevents further operation of the film transporting mechanism. A tracking arm of the lever enters an oncoming perforation in response to transport of the film and thereby permits movement of the lever to operative position. A follower on the lever holds the tracking arm away from the film path when the lever is



returned to starting position in response to actuation of the shutter release and prior to renewed operation of the film transporting mechanism so that the tracking arm cannot reenter the same perforation.

3,662,664

CAMERA SHUTTER INCORPORATING A GOVERNOR MECHANISM

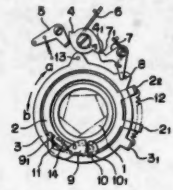
Takeshi Goshima, Tokyo, Japan, assignor to Canon Camera Kabushiki Kaisha, Tokyo, Japan

Continuation of application Ser. No. 373,383, June 8, 1964, now abandoned. This application June 6, 1966, Ser. No. 555,316

Claims priority, application Japan, June 20, 1963, 38/32348

Int. Cl. G03b *9/58*

U.S. Cl. 95—63 **6 Claims**



Lens shutter for a camera in which the shutter blades determine the exposure time and the diaphragm opening, the shutter blades being rotatably mounted on one rotatable ring and interconnected with a second ring rotatable relative to the first ring, a governor mechanism being provided on either of the two rings and cooperating with the other of the two rings to provide a shutter speed control in accordance with the diaphragm setting.

3,662,665

APPARATUS FOR TRANSPORTING ROLL FILM OR THE LIKE

Louis Achilles Meeussen; Emile Frans Stievenart, both of Antwerp, Belgium; Karl-Wilhelm Schranz, Opladen, Germany; Josef Busch, Bensberg-Rafrath, Germany; Siegfried Froch, Cologne-Stammheim, Germany, and Herbert Bruck, Leverkusen, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

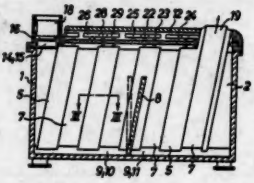
Filed Nov. 14, 1968, Ser. No. 775,803

Claims priority, application Germany, Nov. 18, 1967, P 15 97 658.6

Int. Cl. G03d *3/08*

U.S. Cl. 95—94 R **14 Claims**

Photographic roll film is transported through the tank of a continuous developing unit by moving along an extended helical path defined by a stationary drum which is installed in the tank and has a cylindrical wall carrying a helical rail formed with outwardly flaring helical channels for the edges



of roll film. Driven transporting rollers extend into openings provided therefor in the drum to engage the edges of film and to transport it in the channels.

3,662,666

PHOTOGRAPHIC APPARATUS WITH ADJUSTABLE FILTER

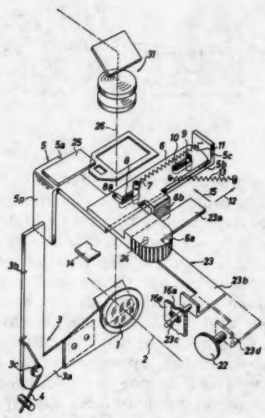
Karl Neudecker, Munich, and Friedrich Winker, Unterhaching, both of Germany, assignors to Afga-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 11, 1970, Ser. No. 45,485

Claims priority, application Germany, June 19, 1969, G 69 24 527.8

Int. Cl. G03b *19/00*

U.S. Cl. 95—11 L **13 Claims**



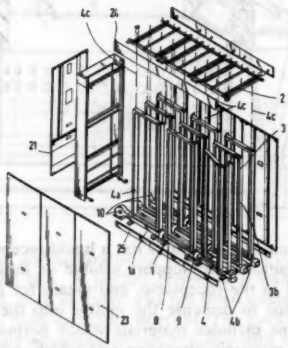
A photographic camera wherein a filter is moved away from the path of incoming scene light in response to attachment of a source of artificial light. The filter is also movable by way of a manually operated selector which can be locked in a position corresponding to inoperative position of the filter. The selector is automatically unlocked in response to attachment of the light source but continues to hold the filter away from the path of incoming light as long as the light source remains attached. A spring returns the filter into the path of incoming light when the light source is detached so that the camera is then ready for making of exposures in daylight.

3,662,667

FRAME ARRANGEMENT FOR ELECTRONIC DEVICES

Kurt Murawski; Anton Schmucker; Bernd Sensburg, and Josef Lanzendorfer, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed July 24, 1970, Ser. No. 57,927
Claims priority, application Germany, Aug. 13, 1969, P 19 41 276.1
Int. Cl. H02b *1/00*; F25d *17/04*
U.S. Cl. 98—40 R 3 Claims



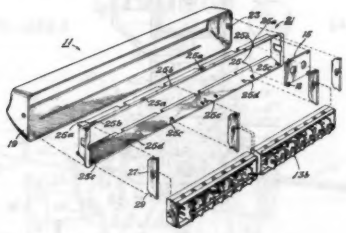
A frame arrangement for supporting electronic devices is disclosed in which groups of components are supported in vertical holding frames. These frames are fixedly attached or swivel-mounted about a vertical axis in a cabinet. Cooling air can be introduced through hollow spars integral with the holding frames.

3,662,668

BEZEL INNER GUIDE FRAME

Randall W. Johnson, 421 Circle View Drive N., Hurst, Tex.

Filed Aug. 24, 1970, Ser. No. 66,221
Int. Cl. F24f *13/08*
U.S. Cl. 98—40 V 10 Claims



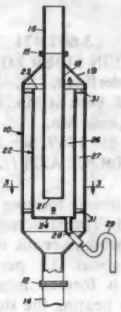
A bezel for use in a fluid distribution system characterized by an outer frame for connecting with a plenum and an inner guide frame adapted to conformingly fit within the outer frame to define a relatively streamlined flow boundary therewithin, the inner guide frame having a plurality of stations for mounting a plurality of louvers and a control panel within the outer frame. Also disclosed are preferred embodiments in which a plurality of sets of stations are included within the inner guide frame such that a variety of sizes of louvers may be employed; wherein the set of stations comprise at least a pair of stations adapted to receive a control panel and a pair of stations adapted to receive a support web that may be snapped into place, the support web in turn having a slot adapted for receiving the louvers which may be snapped into place; as well as preferred materials of construction.

3,662,669

AIR FLOW CONTROL FOR FLARE STACK

Claude E. Cullinane, Jr., Houston, Tex., assignor to John Zink Company, Tulsa, Okla.

Filed Jan. 17, 1969, Ser. No. 792,010
Int. Cl. F23l *17/02*
U.S. Cl. 98—60 1 Claim



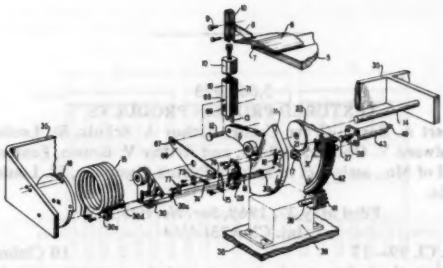
An apparatus for limiting air flow into a flare stack comprising an inlet tube closed on the upper end and terminating in an open lower end connected to the flare stack, a cup-shaped member coaxially spaced within the tube having a substantially closed end spaced above the lower end of the tube and an open upper end and an exit conduit coaxially spaced within the cup member and having an open end extending near the closed end of the cup member, said conduit extending upwardly through the closed end of the tube.

3,662,670

BLAST-ACTUATED VALVE-CLOSURE SYSTEM

Robert Gordon McCoy, Whippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 26, 1970, Ser. No. 40,527
Int. Cl. F23l *13/08*
U.S. Cl. 98—119 32 Claims



A blast-actuated valve-closure system for closing an opening in response to the overpressure of a blast. The system comprises a plurality of louvers disposed across the opening in a normally open position. The louvers are fastened by cranks to a rod which is adapted to be moved by a rotatable actuating crank driven by a torsion spring. Normally, rotation of the actuating crank is blocked by two spring-loaded rollers interposed in a detent therein. A rotatable triggering crank is responsive to the impingement of a blast pressure wave on

the louvers for unblocking the actuating crank which then effects movement of the rod for tilting the louvers to their closed position. A rotatable resetting crank is provided for restoring the actuating crank and the rod to their initial positions thereby moving the louvers to their open position. In addition, the actuating crank may alternatively be unblocked by electromechanical means which has its energization controlled either electrically by sensing devices or manually by an attendant.

3,662,671

PROTEIN FIBER FORMING

Christopher W. Frederiksen, St. Louis, and Wilhelmus Heusdens, Kirkwood, both of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed May 19, 1969, Ser. No. 825,973
Int. Cl. A23l *1/20*
U.S. Cl. 99—17 **9 Claims**

A process of continuously forming tender textured protein structures is disclosed. The structures are formed from an aqueous slurry of a proteinaceous material having a solids content of up to about 35 percent by weight. The proteinaceous slurry is formed into textured filaments or fibers by continuously heating the slurry under pressure and cooling the slurry.

3,662,672

PROTEIN FIBER FORMING

Ralph A. Hoer, Ballwin, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed May 19, 1969, Ser. No. 825,979
Int. Cl. A23l *1/20*
U.S. Cl. 99—17 **7 Claims**

A process of continuously forming tender textured protein structures is disclosed. The structures are formed from an aqueous slurry of a proteinaceous material having a solids content of up to about 35 percent by weight. The proteinaceous solids should be of a fairly high purity. The proteinaceous slurry is formed into textured filaments or fibers by continuously heating the slurry under pressure and cooling the slurry. The texture of the protein structures can be readily controlled by the process conditions, starting material, or reagents used in the process.

3,662,673

TEXTURED PROTEIN PRODUCTS

Robert A. Boyer, Creve Coeur; Arthur A. Schulz, St. Louis; Edward V. Oborsh, Ballwin, and Arthur V. Brown, Fenton, all of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed May 27, 1969, Ser. No. 828,389
Int. Cl. A23j *1/14*
U.S. Cl. 99—17 **10 Claims**

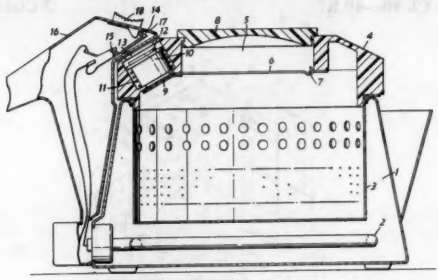
A method for producing expanded, textured protein products which comprises mixing oleaginous seed materials and an aqueous liquid in a ratio of between 1:0.2 and 1:4 to form a mixture having a pH of between about 4 and 7; generating heat internally in the mixture by means of radiant energy (e.g. infrared, microwave, induction ovens) to expand the mixture at substantially atmospheric pressure to form an expanded product, setting the expanded product to form an expanded substantially water-insoluble irreversible cross-linked structure; and subsequently cooling the expanded product.

3,662,674

BEVERAGE MAKING APPARATUS

Georges Jean Louis-Marie Clausse, 5 Muncester House, Ferry Lane, Laleham, Middlesex, England

Filed Oct. 9, 1970, Ser. No. 79,610
Claims priority, application Great Britain, Oct. 9, 1969, 49,708/69
Int. Cl. A47j *31/18*
U.S. Cl. 99—283 **23 Claims**



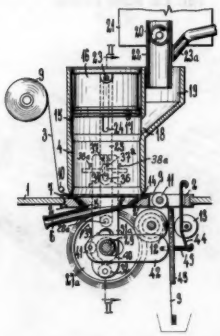
Beverage making apparatus has a liquid receptacle, means normally positioned to support soluble or infusible matter above liquid in the receptacle, and means for releasing the support means to dispense the matter into the liquid. The release means includes materials which normally are held together by magnetic attraction and which, when the temperature of the body exceeds a predetermined value, separate from one another to release the support means.

3,662,675

FILTERING DEVICE FOR PREPARING DRINKS

Frederik Walraven Olland, Bilthoven, Netherlands, assignor to Olland Industrie-en Handelmaatschappij N. V., De Bilt, Netherlands

Filed July 3, 1969, Ser. No. 838,909
Claims priority, application Netherlands, Dec. 23, 1968, 6818569
Int. Cl. A23f
U.S. Cl. 99—289 **10 Claims**

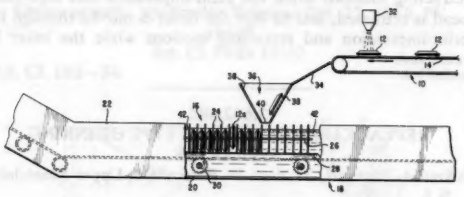


A chamber has an open bottom that is adapted to rest on a sheet of filter paper, and has an aperture for the introduction of solids together with liquid for extracting soluble material therefrom. A piston is reciprocated between a position above such aperture and a position below the aperture where the piston has a sealing engagement with the interior of the chamber. Hold-down apparatus for the chamber is synchronized with the mechanism for reciprocating the piston and operates during the downward stroke of the piston to press the chamber downward against the filter paper, and also operates to free the chamber for upward movement by friction between the chamber and the piston during upward movement of the piston. A stop limits the upward movement of the chamber.

3,662,676
APPARATUS FOR FEEDING FILLED CONTAINERS TO A RETORT OR THE LIKE

Gerald Hartz, Wheaton, Ill., assignor to Reynolds Metals Company, Richmond, Va.

Filed Mar. 31, 1970, Ser. No. 24,089
Int. Cl. A47j 27/20
U.S. Cl. 99—360 4 Claims

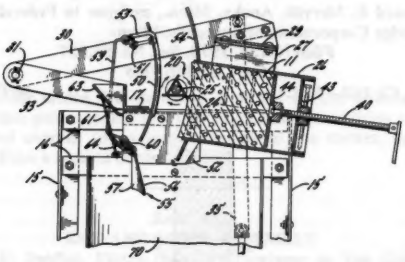


A method of and apparatus for feeding filled containers to a retort or the like. A pocket conveyor is immersed in a suitable liquid, such as water, and has filled containers transferred thereto from an input conveyor. The pocket conveyor is incrementally advanced in synchronism with the advance of filled containers on the input conveyor with the presence of individual containers being detected by a suitable means such as a photocell. The liquid is preferably heated so as to maintain the contents of the containers at or near the temperature at which they have been filled. The liquid is maintained at such a height so as to effect a cushioning of the filled containers as they are transferred from the input conveyor to the pocket conveyor. In addition, the liquid functions to permit a quality control inspection on the containers to be performed in that those containers having too much air therein float in the liquid.

3,662,677
MACHINE FOR SHREDDING CHEESE AND FOR DEPOSITING THE CHEESE ONTO PIZZAS

Donald E. Westling, 2432 Iva Court, Beloit, Wis.

Filed Apr. 1, 1970, Ser. No. 24,654
Int. Cl. A21c 5/00
U.S. Cl. 99—450.1 14 Claims

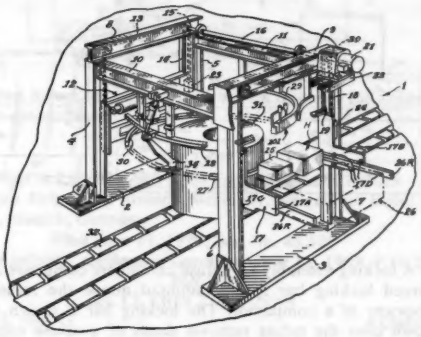


A block of pizza cheese is shredded by a power-rotated cutter as the cheese is swept upwardly past the cutter. The resulting free falling cheese flakes are spread uniformly across an unbaked pizza by a paddle which swings over the pizza and beneath the cutter as the cheese is moved upwardly.

3,662,678
COIL TIGHTENER

Robert A. Johnson, Flossmoor, Ill., assignor to Interlake Steel Corporation, Chicago, Ill.

Filed June 23, 1970, Ser. No. 49,047
Int. Cl. B65b 13/14
U.S. Cl. 100—4 2 Claims

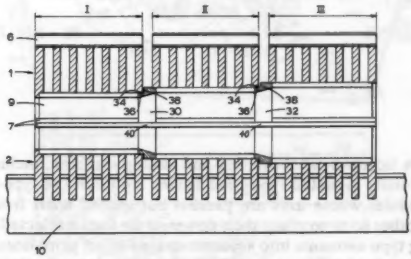


Coil tightening and tying system provides a strap loop having overlapping end portions in circling relation to the coil, establishes travel-retarding engagement of strap at a single intermediate location between the ends of the loop, shrinks the portion of the loop between one of the end regions and the circumferential location into gripping contact with the outer coil convolution, and produces relative rotary movement between the coil and the strap of the loop in a direction to rotate the outer convolution of the coil in a volute direction while maintaining the engagement to maintain gripping contact with the outer convolution.

3,662,679
PRESS CAGES ON SCREW PRESSES

Olaf Georg Braten, P.O. Box 9, 5401 Stord, Norway

Filed Sept. 1, 1970, Ser. No. 68,649
Claims priority, application Norway, Sept. 2, 1969, 3516/69
Int. Cl. B30b 9/06
U.S. Cl. 100—127 2 Claims



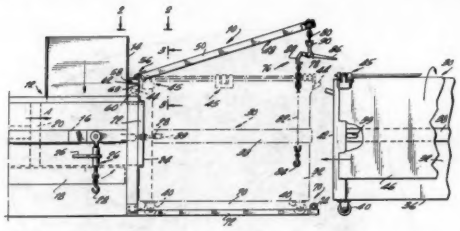
A screw press for extracting liquids from materials such as cotton seeds, copra, linen seeds, bagasse an the like, wherein the screw acts as a conveyor through a press cage having decreasing diametral dimensions and spacings for varying the pressure on the material.

3,662,680

LOCKING ASSEMBLY FOR REFUSE CONTAINERS

Frank Palopoli, Babylon, and Salvatore Palopoli, Amity Harbor, both of N.Y., assignors to Sanitary Controls, Inc., Deer Park, N.Y.

Filed Feb. 18, 1971, Ser. No. 116,330
Int. Cl. B30b *15/00*
U.S. Cl. 100—229 A **13 Claims**



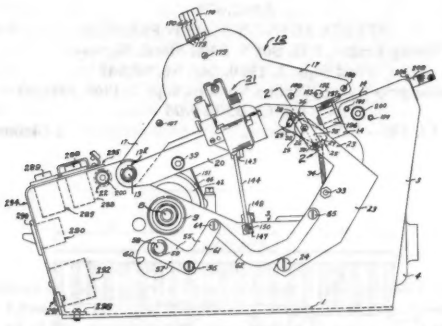
A locking assembly for refuse containers comprises a reinforced locking bar spring mounted above the refuse exit doorway of a compactor. The locking bar is drawn tightly down over the refuse removal doors of a refuse container while the container is held in place against the compactor, to prevent the opening and buckling of these doors during compaction of refuse in said container. The locking bar is drawn into place by a quick-acting load binder.

3,662,681

TICKET PRINTING AND ISSUING MACHINE WITH ROLLER INKER MEANS

Robert D. Smith, Richboro, Pa., assignor to Avery Products Corporation, San Marino, Calif.

Filed Mar. 30, 1970, Ser. No. 23,783
Int. Cl. B41j *27/12, 15/00, 1/46*
U.S. Cl. 101—68 **6 Claims**



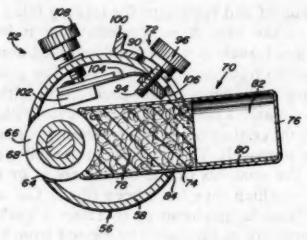
A ticket or label printing and issuing machine, including a pivotally mounted type-head having a plurality of type-wheel modules whose axes are parallel but spaced apart from one another so as to place their downwardly facing selected printing type elements into separate spaced-apart print-lines, each type-wheel having a set of printing type elements along one-half of its periphery and a corresponding set of indicator type elements along the other half of its periphery facing upwardly, each type module having a separate impression-adjusting means, the type-head being releasably locked in its operative position and being swingable to an open access position, and a print-impression and tape-feed head operatively disposed beneath the type-head and including a tape-supporting press-platen and tape-feed-bed and tape-feeder carried on pivoted arms and arranged to be oscillated up and down between an upper printing position and a lower retracted position, and a pivotally mounted inker arranged to be oscillated in a path transverse to the oscillating path of the print-impression and tape-feed head between an inking position and a retracted position, and eccentric means for oscillating the print-impression and tape-feed head between its upper and lower positions and for oscillating the inker between its inking and retracted positions in timed relation to each other so that the inker is moved through its inking and retracting motions while the print-impression and tape-feed head is retracted, and so that the latter is moved through its print-impression and retracting motions while the inker is retracted.

3,662,682

REPLACEABLE CARTRIDGE TYPE OF INKING APPARATUS

Alfred A. Marozzi, 37 West St. Bloomfield, Upper Montclair, N.J.

Filed June 12, 1970, Ser. No. 45,785
Int. Cl. B41f *31/24*
U.S. Cl. 101—219 **13 Claims**



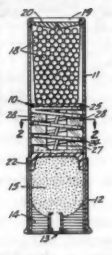
An ink marking system for moving surfaces having an ink component from which a continuous flow of fast drying ink is obtained for prolonged periods of time without recharging. Recharging is accomplished by replacement of an ink storage container having a foam-like filler in wiping contact with an ink transfer roller. The transfer roller is mounted within a housing from which the ink storage container projects releasably clamped in an operative position.

3,662,683

SHOTGUN SHELL WAD

Edward E. Merritt, Anoka, Minn., assignor to Federal Cartridge Corporation, Minneapolis, Minn.

Filed Nov. 4, 1970, Ser. No. 86,687
Int. Cl. F42b *7/08*
U.S. Cl. 102—42 C **30 Claims**



A wad for a shotgun shell comprising a polyethylene unit having an obturator wad connected to a shot pouch by a generally helically extending compression spring member, the flights of which are maintained in spaced relation by axi-

ally extending strut members arranged to cause the spring member to increase in radial dimensions when compressed in an axial direction and thereby scrub the barrel interior as it leaves the latter upon firing of the shell.

3,662,684

HOLLOW CHARGE WARHEAD

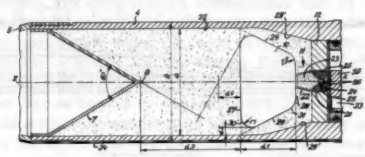
Gaston Jean Olivier Bodinaux, Angleur, Belgium, assignor to Les Ferges De ZeebruggeS.A., Herstal-leg-Liege, Belgium

Filed Dec. 4, 1969, Ser. No. 882,045

Claims priority, application Belgium, Oct. 27, 1969, PV 49639

Int. Cl. F42b *13/10*

U.S. Cl. 102—56 **6 Claims**



A hollow charge warhead having an inert deflecting element embedded within said charge, said element being of a generally frusto-conical shape, the small basis of which being directed towards a punctiform detonator.

3,662,685

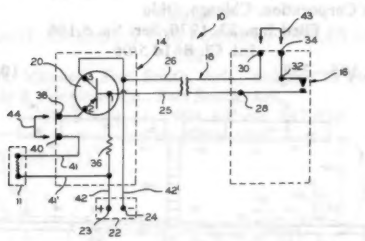
FIRING MEANS FOR A MODEL ROCKET

Daniel M. Lurey, Chicago, Ill., assignor to Simpliway Products Co., Chicago, Ill.

Filed Mar. 5, 1970, Ser. No. 16,749

Int. Cl. F42b *5/08*

U.S. Cl. 102—70.2 R **7 Claims**



A firing means for launching a model rocket utilizing a solid state power means for supplying an electrical firing voltage and current to an ignitor circuit of the rocket, upon signal from a remote control switch.

3,662,686

ROD AND SABOT ASSEMBLY

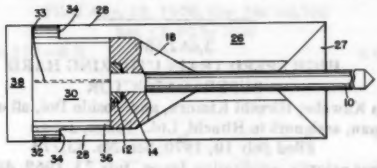
Luigi F. Baldini, Elkins Park, Pa., assignor to The United States of America as represented by the Secretary of the Army

Filed Sept. 18, 1970, Ser. No. 73,340

Int. Cl. F42b *13/16*

U.S. Cl. 102—93 **20 Claims**

The invention relates to an improved rod and sabot assembly comprising a pusher type rod sabot or carrier which is full caliber constructed and functions in the normal manner to launch sub-caliber rod projectile penetrators from conventional smooth bore gun tubes. The inventive improvement obviates the flight perturbation of such penetrators attending the use of conventional longitudinally halved sabots which bear on the stabilizer cone by a construction which extends



the sabot halves to bear on a rearwardly disposed full caliber pusher-spacer plate.

3,662,687

TRACK LEVELLING AND TAMPING MACHINES

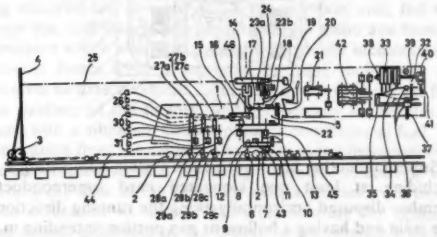
Heinrich Helgemeir, Munich, Germany, assignor to Robel & Co., Munich, Germany

Filed June 11, 1970, Ser. No. 45,500

Claims priority, application Germany, June 12, 1969, P 19 29 869.2

Int. Cl. E01b *27/17, 29/04*

U.S. Cl. 104—7 **4 Claims**



A track levelling and tamping machine having an optical sighting device for sighting elevation marks on a vertical graduated staff on a front vehicle, for alignment of an optical reference sighting system controlling the height of the track-lifting means on a main vehicle of the machine by means of a light transmitter which is associated with the reference sighting system.

3,662,688

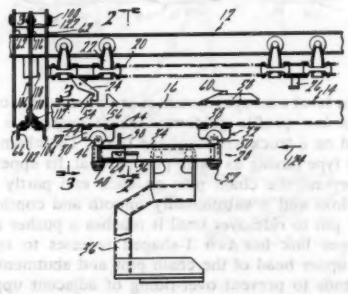
CODER FOR INDUSTRIAL CONVEYORS

Dennis W. Desilets, Sterling Heights, and Michael E. Cleaver, Farmington, both of Mich., assignors to Standard Alliance Industries, Inc., Chicago, Ill.

Filed Jan. 28, 1970, Ser. No. 6,505

Int. Cl. B65g *43/08, 17/42*

U.S. Cl. 104—88 **4 Claims**



A coder for industrial conveyors comprising pivoted indicator and switch actuating means mounted on and movable

with the work carriers, and an actuator means adapted to be mounted beside the track which supports the work carriers and in the path of travel of the indicator means and operative as the work carriers move thereby to move the indicator means either to or from the switch actuating position.

3,662,689

HIGH SPEED TRAIN UTILIZING HARD SUPERCONDUCTOR

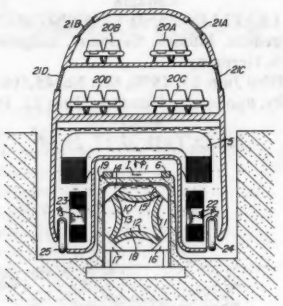
Ushio Kawabe; Hiroshi Kimura, and Toshio Doi, all of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 10, 1970, Ser. No. 53,773

Claims priority, application Japan, July 23, 1969, 44/57702

Int. Cl. B61b *13/08*; **H01f** *9/00*

U.S. Cl. 104—148 SS **4 Claims**



Superconducting high speed train system comprising a rail including at least one elongated hard superconducting member disposed horizontally along the running direction of the train and having a hollow or gap portion extending in the elongated direction, and a train body including a superconducting magnet for generating a magnetic field perpendicular to the hard superconducting member, thereby floating the body from the rail by the magnetic force acting between the superconducting magnet and the hard superconducting member.

3,662,690

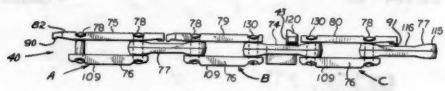
LOW PROFILE TRUCK TOW CONVEYOR SYSTEM

Roderick S. Galloway, Atlanta, Ga.; Horace M. Swartz, Doylestown, and Joseph H. Walsh, Chalfont, both of Pa., assignors to FMC Corporation, San Jose, Calif.

Filed May 5, 1970, Ser. No. 34,673

Int. Cl. B65g *17/38*

U.S. Cl. 104—172 C **24 Claims**



A floor level conveyor system is provided with a chain sliding in a low profile guideway which engages a tow pin mounted on a truck to propel the truck. The chain is of the rivetless type having its chain pins vertical. Its upper link extends beyond the chain pins on each end partly over the center links and is substantially smooth and continuous for the tow pin to ride over until it reaches a pusher assembly. The upper link has two T-shaped recesses to receive T-shaped upper head of the chain pins and abutment surfaces on its ends to prevent over-riding of adjacent upper links. The lower links have a wearing surface projecting below the lower ends of the chain pins to support the chain. The chain operates around horizontal curves, and vertical curves of a larger radius, without losing the continuity of the upper links.

3,662,691

AERIAL ROPEWAY VEHICLE SYSTEM

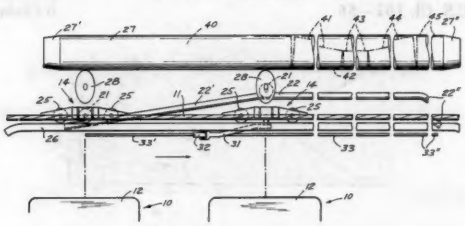
Pierre Goirand, Grenoble, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (Alsthom), Grenoble, France

Filed Mar. 24, 1970, Ser. No. 22,278

Claims priority, application France, Mar. 27, 1969, 6908609

Int. Cl. B61b *9/00, 11/00*

U.S. Cl. 104—173 **8 Claims**



In the aerial ropeway vehicle system herein, when a vehicle arrives at a station at which is provided a carriage rail, its driven connection to the towing cable is broken and simultaneously its load is taken up by the stationary carriage rail and it is connected to a local rotating cylinder drive system. The local drive system is constructed to decelerate the vehicle in a given manner and to accelerate the vehicle as it leaves the station to be again connected to the towing cable.

3,662,692

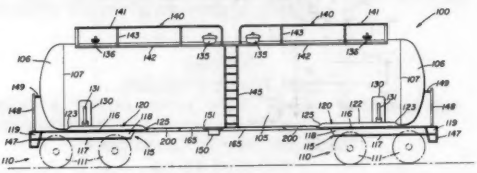
SUPPORT STRUCTURE FOR TANK CAR

Albert E. Price, Brookfield, and Erling Mowatt-Larssen, Warren, both of Ohio, assignors to General American Transportation Corporation, Chicago, Ohio

Filed Jan. 23, 1970, Ser. No. 5,196

Int. Cl. B61d *5/06*

U.S. Cl. 105—358 **10 Claims**

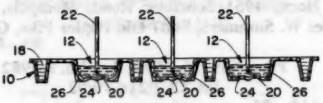


A railway tank car including a longitudinally extending tubular body shell, first and second truck saddle structures respectively positioned adjacent to the outer ends of the body shell for supporting the same upon associated trucks each carrying draft connections, first and second elongated slabbing structures respectively positioned between the first and second truck saddle structures and the body shell, first and second reinforcing members respectively associated with the first and second slabbing structures, each of the reinforcing members including a plurality of parallel spaced-apart bars extending longitudinally of the body shell, the reinforcing members cooperating to provide at least one bar extending substantially the entire length of the body shell between the slabbing structures, the bars being suitably secured to the slabbing structures and to the body shell to distribute stress due to buff and draft forces to the body shell.

3,662,693
METHOD OF MOLDING CANDY IN PLASTIC MOLD

Eugene K. Dana, 937-18th St., Santa Monica, Calif.

Filed Sept. 22, 1970, Ser. No. 74,383
Int. Cl. A23g 3/00
U.S. Cl. 264—299 7 Claims



A plastic mold formed of low density polyethylene having a relatively low deformation temperature has an upwardly opening mold cavity preferably with a mold extension extending horizontally from the mold cavity and opening freely horizontally into the cavity. Candy formed of principally sweetening ingredients such as sugar and corn syrup mixtures and the like is heated to approximately 280° F. assuming a hot fluid state, said temperature being in the order of approximately 30° to 100° above the plastic mold deformation temperature. Where the cavity extension is provided, a usual stick is positioned partially in the mold cavity and partially in the cavity extension only part vertically filling the cavity extension and the hot fluid candy is poured into the mold cavity intermediate thereof against a cavity bottom wall spaced from cavity sidewalls. As the hot fluid candy contacts the cavity walls which are at room temperature, a border portion of the candy immediately at least partially solidifies insulating the cavity sidewalls against the remaining hot fluid candy being poured and until all of the candy solidifies thereby preventing deformation of the plastic mold. A similar solidified border is formed by the candy around the stick at the general line between the mold cavity and cavity extension preventing the hot fluid candy from flowing horizontally into the cavity extension despite there being no obstruction between the cavity and cavity extension.

3,662,694
LINKAGE ASSEMBLY FOR FOLDING TABLES AND THE LIKE

Paul H. Mitchell, Fort Smith, Ark., assignor to Fort Smith Table & Furniture Co., Fort Smith, Ark.

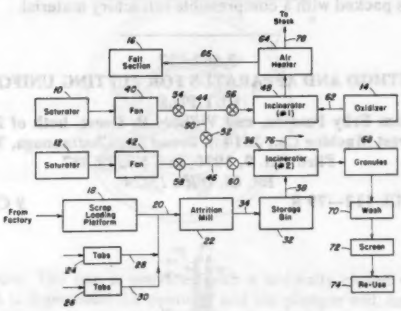
Filed Sept. 11, 1969, Ser. No. 857,054
Int. Cl. A47b 3/00
U.S. Cl. 108—131 10 Claims

The folding table includes a pair of U-shaped leg units, each comprising two legs connected by an apron member. The leg units are pivotally attached to opposite ends of a table top, having side apron members, by a compact linkage assembly located at each corner of the table and concealed by the apron members. Each linkage assembly includes an inclined link member having one end pivotally attached to a leg unit and the other end pivotally attached to a side apron. Each linkage assembly also includes latch members locking the leg unit to the table top in both the erected and the folded positions and an adjustment device is provided to ensure that the leg members tightly abut the table top side aprons in the locked condition.

3,662,695
ROOFING FACTORY FUME AND SOLID WASTE DISPOSAL SYSTEM

Harry B. Johnson, Somerville, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Aug. 18, 1970, Ser. No. 64,706
Int. Cl. F23g 7/00
U.S. Cl. 110—8 R 5 Claims

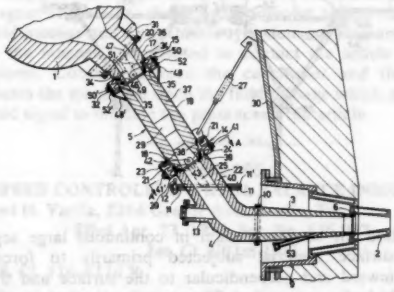


The solid wastes of combustible and noncombustible roofing material are comminuted in an attrition mill, fed to a surge bin, and then used as fuel in a solid waste and fume incinerator which also receives and ecologically incinerates the exhaust fumes from a saturator. A fume incinerator also receives saturator exhaust fumes along with effluent gas from the oxidizer of the factory, and ecologically incinerates the same with a minimum consumption of conventional fuel. The fume ducts from the saturator exhausts to the incinerators include a cross duct and switching valves for selectively controlling the flow of the saturator exhaust fumes from one or both saturators to one or both incinerators for optimum operational efficiency of the system in accordance with current production of the roofing factory. Granules resulting from the solid scrap incineration are washed and recovered for re-use.

3,662,696
TUYERE STOCK FOR FURNACES

Rene N. Mahr, Luxembourg, Grand Duchy, Luxembourg; Henri Joseph Radoux, Luxembourg, Grand Duchy, Luxembourg, and Clement E. Burton, Esch sur Alzette, Grand Duchy, Luxembourg, assignors to S.A. Des Anciens Etablissements Paul Wurth

Filed Apr. 20, 1970, Ser. No. 30,179
Claims priority, application Luxembourg, Apr. 21, 1969, 58,457; Feb. 13, 1970, 60,351
Int. Cl. F23l 5/00
U.S. Cl. 110—182.5 7 Claims



A feed conduit having utility in the transmission of heated fluids is disclosed. The apparatus of the present invention is

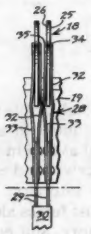
characterized by a curved section, which communicates at its discharge end with a nozzle which supplies the heated fluid to the desired environment, and by a straight portion, which couples the source of heated fluid to the curved portion; the straight portion being formed from at least three members with an intermediate member being connected to the end members by means of articulated joints comprised of cardan compensators. The bellows units of the cardan compensators are protected from the fluid being transmitted by cascade joints packed with a compressible refractory material.

3,662,697

METHOD AND APPARATUS FOR TUFTING UNIFORM CUT PILE

William Erby Passons, and William R. Reese, both of Broad Street Machine Co., 2614 S. Broad St., Chattanooga, Tenn.

Filed Oct. 9, 1970, Ser. No. 79,387
Int. Cl. D05c *15/24*
U.S. Cl. 112—79 R **9 Claims**



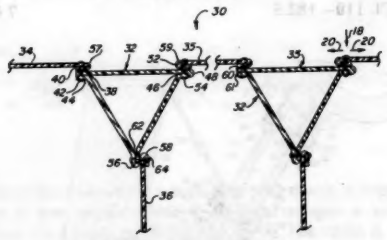
A tufting looper mechanism including a looper element or hook and a knife member having blades or cutting edges disposed on opposite sides of each looper element, and means for reciprocably moving the looper element and knife edges relative to each other for cutting a yarn loop held by the looper element in two different places to form cut pile yarn ends of equal height.

3,662,698

METHOD OF SEWING A SEAM AND PRODUCT THEREOF

James Scott Stineman, 615 W. Civic Center Drive, Santa Ana, Calif.

Continuation-in-part of application Ser. No. 799,806, Feb. 17, 1969, now abandoned. This application Apr. 14, 1970, Ser. No. 28,428
Int. Cl. B32b *7/08*
U.S. Cl. 112—426 **2 Claims**



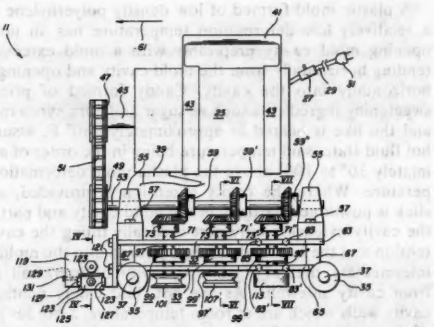
A method for sewing a seam in continuous large segmented surface material subjected primarily to forces directed inward and perpendicular to the surface and the product thereof are presented. The most severe seam stresses in a continuous segmented surface material subject to force directed inward and perpendicular to the surface are perpendicular to the applied force at the seams. The product of the present invention includes lap seams between adjacent surface segments where said seams are subject to great stress when the surface is subject to a force directed inward and perpendicular to the surface.

3,662,699

METAL ROOF SEAMING MACHINE

Leo B. Horn, 4951 Scheibler Road, Memphis, Tenn., and Charles W. Summers, 7087 Old Poplar Pike, Germantown, Tenn.

Filed Nov. 16, 1970, Ser. No. 89,982
Int. Cl. B21d *39/02*
U.S. Cl. 113—55 **4 Claims**



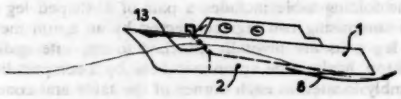
A machine for forming a standing seam on heavy gauge metal roof panels having upstanding opposite margins terminating upwardly with a preformed partially closed interlocking portion being bent so as to be substantially parallel with the plane of the panel. The machine includes a pair of rollers horizontally disposed axially, being rotatably attached to the forward end of the machine and arranged so as to straddle the interlocked portion of two adjacent panels for: (1) closing the interlocked portions; (2) foldably urging the interlocked portions of the panels downwardly so as to start forming the standing seam; (3) clampingly securing the front of the machine to the panels. The machine also includes a plurality of vertically disposed pairs of rollers, each succeeding pair further folding the interlocked portions of the panels downwardly so that the final pair finishes forming the standing seam. Additionally, certain of these rollers include flanges suitably arranged to engage the interlocked portions of the panels so that the rearward end of the machine is held firmly against the metal as it is being folded.

3,662,700

FLOATING HULL TO MAINTAIN A CUSHION OF AIR

Leon Roumejon, 22 bis Boulevard de Bellevue, Chambery, Savoie, France

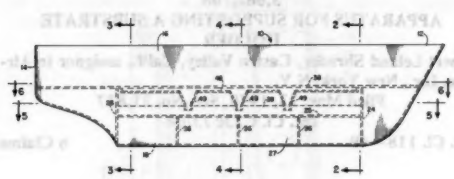
Filed Apr. 16, 1970, Ser. No. 29,187
Claims priority, application France, Apr. 18, 1969, 6911368; Mar. 10, 1970, 7009576
U.S. Cl. 114—67 A **5 Claims**



A floating hull is provided with an elongated tunnel on the bottom surface thereof the forward end of which may be terminated by a bulkhead. The heart of the tunnel may gradually diminish toward the stern of the boat or the heart of the tunnel may be constant from the bulkhead to the stern of the boat. An air intake opening is placed at the bow of the

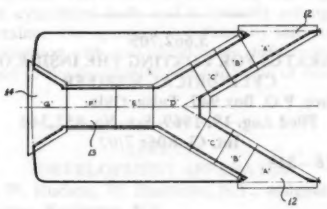
hull above the normal water-line of the boat and is disposed in communication with the tunnel in the vicinity of the bulkhead defining the forward end of the tunnel.

3,662,701
MARINE HULL
Alvin A. Cobb, 1625 Foucher St., New Orleans, La.
Filed May 7, 1970, Ser. No. 35,365
Int. Cl. B63b *43/10*
U.S. Cl. 114—68 **1 Claim**



A hull having conventional fore and after parts but with an intermediate part secured therebetween and comprising two similar closed structures having rounded bottoms and arranged longitudinally parallel and spaced transversely apart to define a center well opening upwardly and downwardly. The outer sides of the closed structures are extended upwardly to form the opposite sides and freeboard of the hull. A plurality of decks are spaced vertically apart between said side and define grate covered openings that vertically interconnect said center well with the topside.

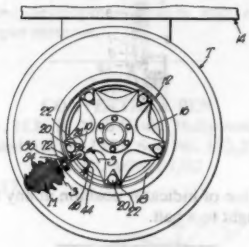
3,662,702
MULTIPLE PROPELLER DUCTED SYSTEM
David John Doust, 276 St. James St. W., Montreal, Quebec, Canada
Filed June 16, 1970, Ser. No. 46,779
Int. Cl. B63h *5/08*
U.S. Cl. 115—37 **18 Claims**



A ducted propulsion system for waterborne, semi-submerged or fully submerged vessels comprising a ducted system having two or more intake ducts which open below the mid depth of the vessel, and which merge into a specially shaped non-circular composite duct which generally extends in the fore and aft direction of the vessel. Propeller means are mounted independently in the composite duct and adapted to induce a flow of water through the system of ducts to propel said vessel. The propeller means comprise two or more propellers or impellers each having its own independent shafting, bearings and supporting structure.

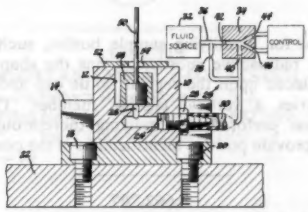
3,662,703
TIRE UNDERINFLATION TELLTALE DEVICE
Richard M. Jackson, 42 Augar St., Hamden, Conn.
Filed Sept. 3, 1970, Ser. No. 69,336
Int. Cl. B60c *23/06*
U.S. Cl. 116—34 **14 Claims**

A casing with two compartments has in one cylinder compartment a plunger, and in the other compartment a replaceable spray can which has some sliding freedom therein, with the plunger being on one side subjected to air pressure which is always the same as the air pressure in an associated tire, and being on its other side subjected to the force of a preloaded spring which will displace the plunger when the tire pressure drops below a given safe minimum



pressure. The can is provided with a normally closed valve which is depressible for opening, and the plunger will, on displacement, move the can with its valve against an abutment to thereby depress and open the valve for discharge of a telltale spray from the can and its passage through a tube against the tire to form a readily perceptible telltale mark or blot thereon.

3,662,704
FLUIDIC DETECTION DEVICE
Fred W. Dega, Oak Park, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed July 20, 1970, Ser. No. 56,593
Int. Cl. G01l *19/12*
U.S. Cl. 116—70 **3 Claims**

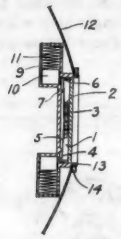


A fluidic detection device for detecting the presence of an article or component. The detection device has a housing having a fluid passage therein and a detector portion having a magnet attracted to the housing adjacent to and closing the fluid passage and a catwhisker type detector element secured to the magnet and adapted to contact the article or component. Contact between the catwhisker and the article causes the magnet to open the fluid passage which controls a fluid signal to indicate the presence of the article.

3,662,705
SPEED CONTROLLED WHEEL BALANCE INDICATOR
Karl O. Vartia, 5214 Grover Ave., Austin, Tex.
Filed Apr. 23, 1971, Ser. No. 136,937
Int. Cl. G01m *1/00*
U.S. Cl. 116—114 R **1 Claim**

In an indicator device using a float immersed in viscous fluid at the axis of rotation of a rotating assembly to detect uni-directional, cyclically repeated accelerative forces acting upon the assembly, a speed responsive mechanism is ar-

ranged to allow float movement only while rotation is occurring at higher than a prescribed minimum speed thus permitting observation of indicator position at any time after the assembly is brought to a halt.

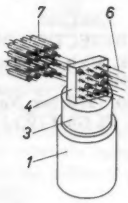


3,662,706

IDENTIFYING DEVICE FOR SPECIMEN CONTAINERS CONTAINING RADIOACTIVE SUBSTANCES

Erkki Juhani Soini, Abo, Finland, assignor to Wallac Oy, Abo, Finland

Filed Jan. 17, 1969, Ser. No. 792,026
Int. Cl. G09f *9/00*
U.S. Cl. 116—114 **1 Claim**



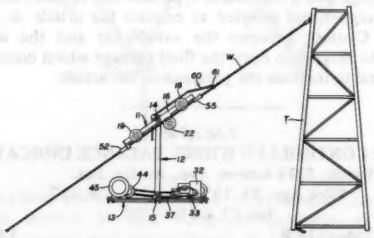
A device for identifying sample bottles, such as bottles containing radioactive substances, has the shape of a cap which is placed upon the regular bottle cap and the top of which carries a vertical tag-like member. The tag-like member has perforations extending therethrough and arranged to provide positive identification of the contents.

3,662,707

GUY WIRE RUST INHIBITOR APPLICATOR

Wendel E. Dreve, Jr., 1592 College Hill Drive, Columbus, Ohio

Filed Feb. 11, 1970, Ser. No. 10,450
Int. Cl. B05c *5/02, 11/00*
U.S. Cl. 118—7 **3 Claims**



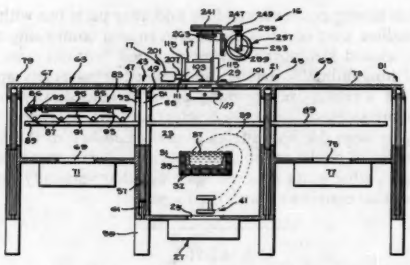
A self-contained wheeled carriage adapted to be applied to and to be supported by an inclined wire such as an inclined guy-wire used in supporting a radio or television broadcast tower. The carriage is provided with self-contained means for causing it to climb the inclined wire and descend at a controlled rate of speed. The power unit for the carriage and other units are supported on a platform suspended from the carriage by a pendulum arm which maintains the platform substantially horizontal during the ascent and descent on the guy-wire. The units carried by the platform may include containers for carrying supplies of the substances used in the treating operations.

3,662,708

APPARATUS FOR SUPPORTING A SUBSTRATE HOLDER

Robert Leland Shrader, Castro Valley, Calif., assignor to Airco, Inc., New York, N.Y.

Filed Mar. 23, 1970, Ser. No. 21,837
Int. Cl. C23c *13/08*
U.S. Cl. 118—49 **6 Claims**



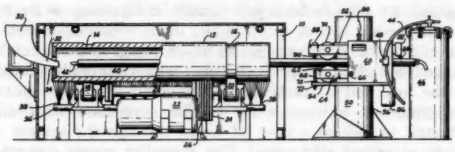
Apparatus is described for supporting a substrate holder in a vacuum coating system. The substrate holder is supported and, if desired, rotated within the vacuum system by an electromagnetically energized armature.

3,662,709

APPARATUS FOR COATING THE INSIDE OF A CYLINDRICAL MEMBER

Nathan Janco, P.O. Box 947, Tulsa, Okla.

Filed Aug. 19, 1969, Ser. No. 851,344
Int. Cl. B05c *7/02*
U.S. Cl. 118—318 **4 Claims**

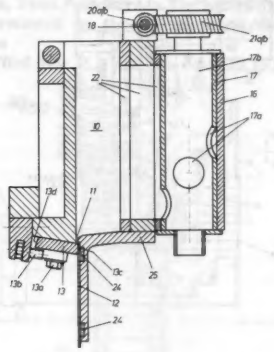


This invention is an improved spray equipment for use with a cylindrical metal mold which is rotated about its horizontal axis. A stationary support is mounted adjacent one end of the cylindrical metal mold and supports a vertically adjustable spray lance. The spray lance is moved longitudinally into and out of the bore of the cylindrical mold. Tiltable means are provided on the stationary support for keeping the end of the spray lance along the axis of the cylindrical metal mold out of contact with the inside of the cylindrical metal mold.

3,662,710
APPARATUS FOR POURING SURFACE TREATMENT LIQUIDS ONTO WORKPIECES

Werner Pankoke, and Dieter Kormeyer, both of Bielefeld, Germany, assignors to Theodor Hymmen KG, Bielefeld, Germany

Filed Sept. 11, 1969, Ser. No. 857,182
Int. Cl. B05c *5/00*
U.S. Cl. 118—324 **7 Claims**

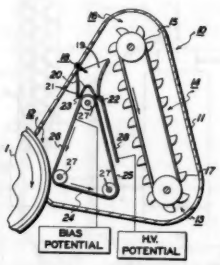


The invention comprises apparatus for pouring surface treatment liquids onto substantially level workpieces to enable different liquids with different viscosities to be used to good effect comprising an elongated liquid container having upper liquid feed means and walls defining a longitudinally extending pouring gap between their surfaces in the lower region of said container, characterized by an overflow device for adjusting said liquid level in said container which device is located on said container and communicates with said liquid container; the surface of said overflow device defining openings at various levels which are offset relative to one another and alternately closable whereby said liquid level may be adjusted. The overflow device is preferably a rotatable hollow cylindrical body and is laterally arranged of the liquid container, the opening(s) defined by said surface and in communication with said liquid being differently locatable with respect to the liquid surface by rotation of said cylindrical body.

3,662,711
DEVELOPMENT APPARATUS

Frederick W. Hudson, W. Henrietta, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Mar. 19, 1970, Ser. No. 21,008
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **11 Claims**

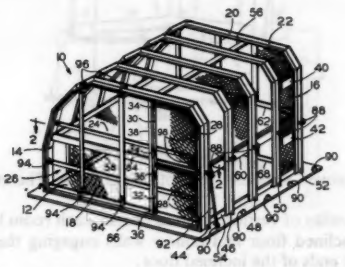


An apparatus for developing a surface bearing a latent electrostatic image to be developed wherein developer material is cascaded between the image bearing surface and a movable electrode member. The electrode member carries to the development zone a supply of toner particles on its surface which provides enhanced development results. As the carrier particles in the developer flow become depleted of toner in the development zone, the toner supplied by the endless electrode is attracted to the carrier for retonerization directly in the development zone. Also, the impact of the carrier upon the electrode releases toner from the electrode to effect enhanced development results with a relatively low flow of developer material.

3,662,712
CONVERTIBLE PEN

Murray Singer, 1626 N. 28th Court, Hollywood, Fla.

Filed Apr. 8, 1971, Ser. No. 132,273
Int. Cl. A01k *01/02*
U.S. Cl. 119—17 **10 Claims**

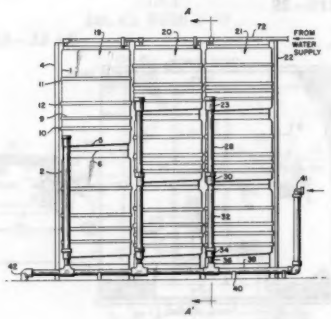


An animal pen having a platform dividing the pen into two levels each of which is adapted to contain small animals, the platform being removable to convert the pen to receive cargo or larger animals. The pen is shaped to fit in a vehicle, such as an airplane, for transport of the animals or cargo by the vehicle.

3,662,713
MODULAR ANIMAL CAGE SYSTEM

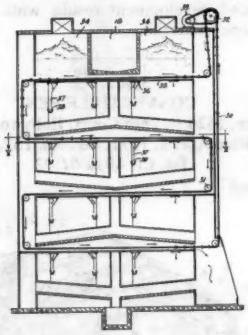
Sidney Sachs, 50 Hobart Road, Paramus, N.J.

Filed Nov. 18, 1969, Ser. No. 877,809
Int. Cl. A01k *31/04, 01/02*
U.S. Cl. 119—18 **13 Claims**



Modular animal cage system including adaptable gravity sewage system with overall pressure flushing, individual adaptable water supply system, adjustable floor and perch, anti-insect strips, swivel feeding bowl, adjustable doors using hinge adaptor and lock adaptor, cleaning device, adjustable swivel drinking device with water cut-off, and safety spring lock.

3,662,714
STRUCTURE FOR HOUSING ANIMALS
Yull Gunn Poon, 204 Centre Street South, Calgary, Alberta, Canada
Filed Apr. 2, 1970, Ser. No. 25,221
Int. Cl. A01k 01/00
U.S. Cl. 119—18 2 Claims



An improved structure for housing animals. The structure includes:

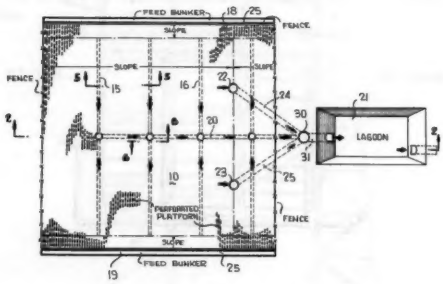
a. a plurality of vertically tiered rooms, each room having a slightly inclined floor and hollow walls engaging the higher and lower ends of the inclined floor,

b. deflector means to direct refuse material falling from the lower end of one floor down a hollow wall to the higher end of a floor on the next lower tier,

c. conveyor means to carry material across each inclined floor from the higher end to the lower end, whereby refuse material is carried sequentially from floor to floor along a continuous path from the top to the bottom of the structure, and

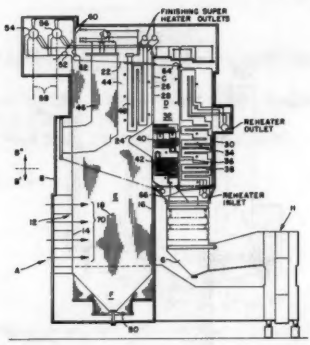
d. conveyor means to carry feed from storage bins at the top of the structure down through the several tiers with feed outlets serving each tier.

3,662,715
ANTI-POLLUTION CATTLE FEEDING STATIONS
Fred L. Schapler, 1313 Mitchell Blvd., Mitchell, S. Dak.
Filed June 24, 1970, Ser. No. 49,351
Int. Cl. A01j 1/00
U.S. Cl. 119—28 5 Claims



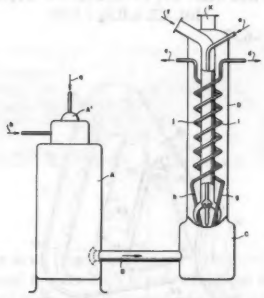
Animal feeding stations comprising a layer of perforated sheet steel, underlaid by a layer of particulate material such as sand and gravel, which is in turn underlain by a base lamina of asphalt. Collection pipes are located in the porous material, which are arranged to lead liquid waste produced by the animals to a sump.

3,662,716
FURNANCE ENCLOSURE FOR NATURAL CIRCULATION GENERATOR
William D. Stevens, North Caldwell, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.
Filed Dec. 14, 1970, Ser. No. 97,700
Int. Cl. F22d 7/00
U.S. Cl. 122—6 A 11 Claims



A natural circulation generator having a rectangular furnace enclosure. A plurality of parallel, upright, finned tubes welded together along their lengths make up the walls of the enclosure. Burners are provided in the front wall of the enclosure, in the lower portion thereof, providing a heat input to the finned tubes. In accordance with the present invention, the tubes have a first diameter in the lower portion of the furnace, and a second greater diameter in the upper portion of the furnace. The increased tube diameter in the upper portion of the furnace gives a higher circulation ratio in the generator, and in addition provides more heat absorption surface area which increases the throughput steam flow per hour-foot of furnace periphery. This enables construction of a natural circulation unit having increased capacity.

3,662,717
WASTE-HEAT BOILER
Leonard W. Ter Haar, Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.
Filed Dec. 30, 1970, Ser. No. 102,588
Claims priority, application Netherlands, Jan. 21, 1970, 7000812
Int. Cl. F22b 1/18
U.S. Cl. 122—7 R 5 Claims



An improved waste-heat boiler for cooling and recovering heat from hot gases. The improvement comprises employing two concentric tubes for delivering coolant liquid, the coolant liquid from the inner concentric tube under pressure

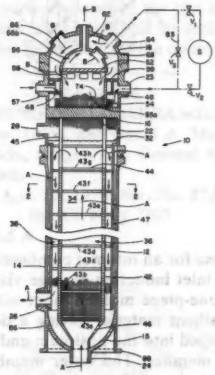
serving as feed to a plurality of ejectors which draw coolant liquid from the outer concentric tube and by means of an arrangement of spray nozzle arms, direct the coolant against the bottom plate of the boiler and the inlet ends of the heat exchange tubes connected thereto.

3,662,718

SODIUM HEATED STEAM GENERATOR

Ronald B. Creek, Northridge, Calif., and Karl A. Gardner, Chatanooga, Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 2, 1971, Ser. No. 120,151
Int. Cl. F22b *1/16*
U.S. Cl. 122—32 **5 Claims**



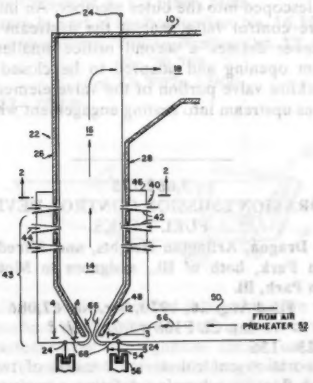
A sodium heated steam generator having a tube sheet which is subject only to saturated or near saturated steam temperatures. Double-walled evaporative and superheated steam tubes extend through said tube sheet into the liquid metal. In both the evaporative and superheated steam tubes the saturated steam passes through the annular passageways which contact the tube sheet.

3,662,719

APPARATUS AND PROCESS FOR SLAG REDUCTION IN A VAPOR GENERATOR

Justin P. Winkin, Fairlawn, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.

Filed Oct. 9, 1970, Ser. No. 79,581
Int. Cl. F22b *37/00*
U.S. Cl. 122—235 R **2 Claims**



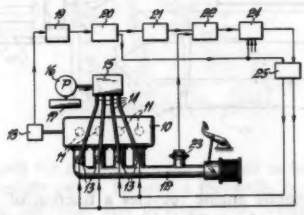
The formation of slag is reduced on the heat absorption surfaces in the furnace section of a vapor generator. This is achieved by circulating a stream of air through the hopper section of the furnace.

3,662,720

FUEL INJECTION ARRANGEMENT FOR ITERNAL COMBUSTION ENGINES

Karl-Ernst Boeters, Berlin; Klaus Streit, Tubingen; Gerhard Conzelmann, Leinfelden; Hermann Schmid, Goppingen, and Hans-Joachim Fleischer, Berlin, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 15, 1970, Ser. No. 55,084
Claims priority, application Germany, July 22, 1969, P 19 37 111.0
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA **21 Claims**



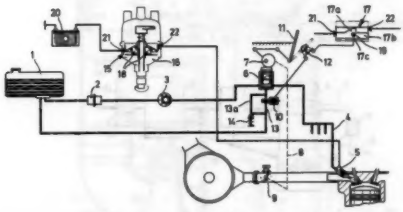
An AND circuit, controlled by an engine-rpm-dependent bistable multivibrator, triggers a monostable circuit that produces a pulse having a length dependent on the intake-manifold-suction pressure. This pulse partly controls a logic circuit also controlled by the output of the multivibrator. The logic circuit, in turn, controls an amplifier the output of which operates the fuel injection spray valves.

3,662,721

FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

Heinz Klein, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Nov. 6, 1969, Ser. No. 874,146
Claims priority, application Germany, Nov. 8, 1968, P 18 07 773.1
Int. Cl. F02b *3/10*
U.S. Cl. 123—32 AE **3 Claims**



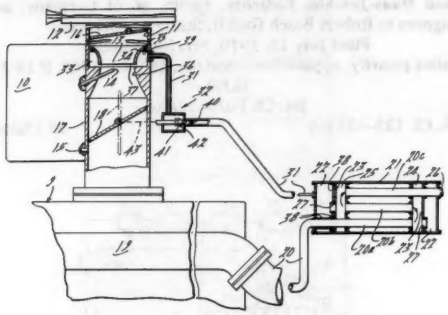
An injection device for internal combustion engines with injection valves and an excess pressure valve controllable by an adjustment of throttle valves for control of the pressure of the introduced fuel.

3,662,722

COOL EXHAUST RECYCLING

Jorma O. Sarto, Orchard Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 22, 1970, Ser. No. 30,722
Int. Cl. F02m 25/06
U.S. Cl. 123—119 A 19 Claims



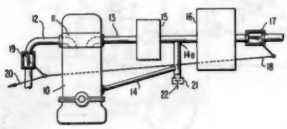
An automobile engine recycles a fraction of its exhaust gases by means of a restricted bypass conduit connecting its fuel-air inlet conduit at the diffuser region of the customary fuel inducing venturi restriction with a source of comparatively cool exhaust gases comprising a dead-end sound attenuating chamber of the exhaust muffler. The chamber is in communication with the exhaust gases in the muffler but is out of the direct exhaust flow path, such that lead contaminants in the exhaust gases cool and solidify as minute particles that readily flow through the restricted bypass duct. The recycling exhaust gas flow is modulated by the pressure differential between the chamber and venturi restriction. A supplemental control valve responsive to the position of the engine throttle valve may be employed in the bypass conduit to close or restrict the latter when the throttle valve is at either its idle or wide open position.

3,662,723

INSTALLATION FOR VENTING THE CRANKCASE OF AN INTERNAL COMBUSTION ENGINE

Hans-Wilhelm Buhl, Stuttgart-1, Germany, assignor to Daimler-Benz Aktiengesellschaft

Filed Apr. 23, 1970, Ser. No. 31,236
Claims priority, application Germany, Apr. 25, 1969, P 19 21 068.5
Int. Cl. F02f 9/02; F02m 25/06
U.S. Cl. 123—119 B 21 Claims



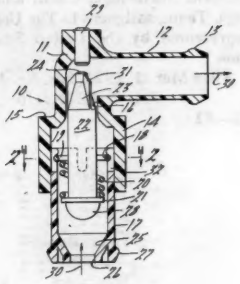
An installation for venting the crankcase of an internal combustion engine in which a vent line that terminates in the crankcase, is positively closed off with respect to the atmosphere when the throttle valve in the exhaust gas line is closed, for example, during engine braking.

3,662,724

CRANKCASE VENTILATION

Wasyl Ohar, Ann Arbor, and Elmer L. McIntire, Northville, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 13, 1971, Ser. No. 106,067
Int. Cl. F02m 25/06
U.S. Cl. 123—119 B 7 Claims



The crankcase for an internal combustion engine is vented to the fuel-air inlet induction passage via a ventilation valve comprising a one-piece molded inner tubular valve housing member of resilient material having a downstream end adjustably telescoped into the upstream end of an outer tubular valve housing member. The outer member has a comparatively small metering orifice which cooperates with a valve element movable within the housing members in response to decreasing pressure in the induction conduit to restrict the orifice. A coil biasing spring within the inner member has an upstream end seated against a downstream facing shoulder of the valve element to oppose the latter's downstream movement. An enlarged downstream coil of the spring is confined within an interior spring retaining enlargement of the inner tubular member adjacent the latter's downstream opening and is insertable, as is also the valve element, through said downstream opening prior to telescoping of the inner member into the outer member. A plurality of endwise opening slits in the inner member at the region of the interior enlargement enable expansion of said downstream opening for insertion of the enlarged spring coil into the enlargement. After the insertion, the resilient material of the inner member returns the expanded downstream opening to its unexpanded condition, whereupon the assembly of the inner member with the valve element and biasing spring confined therein is adjustably telescoped into the outer member. An integral annular backfire control valve seat at the upstream end of the inner member defines a second orifice smaller than said downstream opening and adapted to be closed by an upstream backfire valve portion of the valve element when the latter moves upstream into seating engagement with the valve seat.

3,662,725

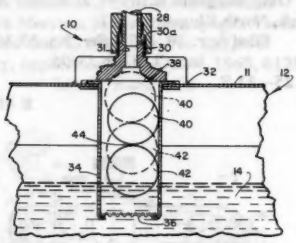
EVAPORATION EMISSION CONTROL DEVICE FOR FUEL TANKS

James W. Dragon, Arlington Heights, and Alfred G. Ocken, Franklin Park, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 26, 1970, Ser. No. 67,086
Int. Cl. F16k 45/02, 31/18
U.S. Cl. 123—136 4 Claims

An evaporation control device consists of two spherical balls which float in a housing defining a cavity so that the balls move up and down in accordance with the fuel level in

the tank to allow the top ball to engage a conical seat to seal the vented passageway from the fuel tank to the engine. The



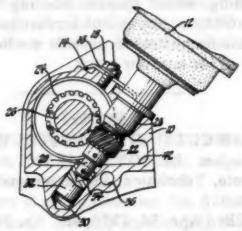
spherical contact surfaces between the two balls allow quick and easy movement of the top ball to seal the opening at once where gasoline moves toward the opening.

3,662,726

DISTRIBUTOR DRIVE ARRANGEMENT

Harold M. Haskew, Utica, and David A. Martens, Washington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 13, 1970, Ser. No. 27,675
Int. Cl. F02p 7/00
U.S. Cl. 123—146.5 A **2 Claims**



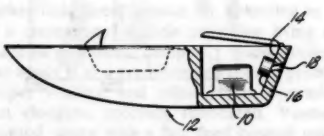
A distributor drive arrangement to prevent spark scatter in which the distributor drive shaft is journaled at one end in a bushing to which oil under pressure is supplied to load the drive shaft in one direction, the oil leaking between the bearing surfaces of the bushing and the shaft so that as the shaft rotates, viscous shearing of the oil will provide a controlled drag on the rotating drive shaft.

3,662,727

BLOCKING CIRCUIT FOR INBOARD ENGINE IGNITION

George W. Abplanalp, 6148 Rogue Lane, Belmont, Mich., and Steve Corson, R.R. 1, Luther, Mich.

Continuation-in-part of application Ser. No. 16,355, Mar. 4, 1970, now abandoned. This application Oct. 12, 1970, Ser. No. 79,799
Int. Cl. F02n 17/00
U.S. Cl. 123—179 B **3 Claims**



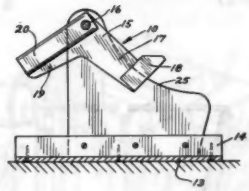
A blocking circuit is provided in combination with an inboard motorboat engine, blower and ignition circuit, which prevents actuation of the ignition circuit until after the blower has functioned for a certain length of time to expel the fumes from the engine compartment. A bimetallic switch, a timer motor, or a switching circuit is utilized to open and close the leads to the ignition circuit. In the embodiment featuring the bimetallic switch, either a pair of alternately operating heating coils cause the switch to transfer from activating the blower to connecting the ignition circuit to the operator's switch, or a single coil by itself or in parallel with the solenoid supply this function.

3,662,728

FOOTBALL CATAPULT

Fergus Retrum, Minneapolis, Minn., assignor to Mini Pro Sports, Inc., Minneapolis, Minn.

Filed Oct. 8, 1970, Ser. No. 79,084
Int. Cl. F41b 3/02
U.S. Cl. 124—1 **5 Claims**



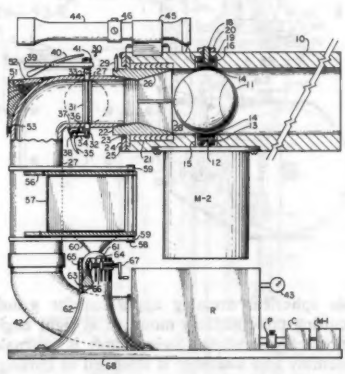
A catapult for propelling a toy football includes a pair of parallel upright panels forming a forwardly facing ramp for supporting the ball, and a lever arm pivotally mounted between the panels. The lever arm includes a kicking leg integrally supporting a kicking foot in position to be in contact with the ball when it is on the ramp and an impact arm integral with and extending outwardly from the leg adjacent the point of pivotal mounting and rearwardly from the ramp in position to impart a kicking action to the ball when the arm receives a manual impact. The kicking foot, when in a rest position, will be positioned above the football supporting ramp. When a football is positioned on the ramp the lever arm will be caused to be pivoted. The kicking foot will thus remain in engagement with the football until which time the football is forced off the ramp by the action of the kicking foot.

3,662,729

BALL THROWING AIR GUN

Homer I. Henderson, 2220 Live Oak St., San Angelo, Tex.

Filed Aug. 10, 1970, Ser. No. 62,567
Int. Cl. F41b 11/00
U.S. Cl. 124—11 **2 Claims**



A ball is propelled from a gun barrel by compressed gas, normally air. The air is stored in a reservoir at a selected pressure to give to the ball the desired muzzle velocity. A quick acting valve is opened to admit the reservoir stored air into the barrel to propel the ball. The device is equipped to

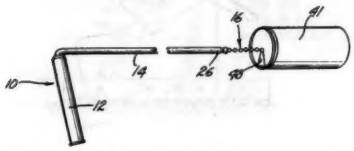
spin the ball if one wishes to simulate pitched curves, such as is used in the game of baseball. A speed-controlled motor is mounted on the breech of the gun barrel and engages the chambered ball. When a curve is desired the motor is energized to spin the ball at any desired spin speed so that the ball has this spin speed when the valve is opened to project the ball. The barrel is rotatable so that the operator can orient the axis of the ball spin.

3,662,730

ELASTIC DEVICE FOR PROJECTING CANS

Marshall H. Feldman, P.O. Box 922, Twenty-Nine Palms, Calif.

Filed June 30, 1970, Ser. No. 51,114
Int. Cl. F41f *7/00*
U.S. Cl. 124—17 **6 Claims**



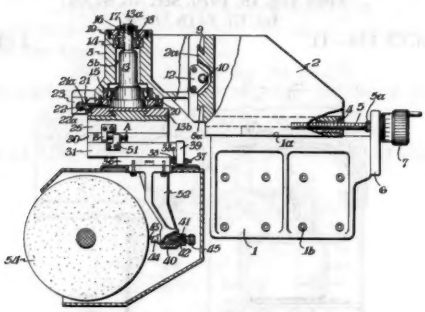
A sling for hurling empty beverage cans into the air for target practice, comprising a handle having a length of elastic rubber tubing connected to one end thereof, wherein the rubber tubing has a length of ball chain attached to its other end. One of the balls of the chain is hooked into the apex of a V-notch cut into the end of the can by a punch having its pointed end shaped to provide a good seat for the ball chain.

3,662,731

DOUBLE SPHERICAL DRESSING APPARATUS

Makoto Kikuchi, Asahimachi, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Asahimachi, Japan

Filed Apr. 1, 1970, Ser. No. 24,581
Claims priority, application Japan, Apr. 7, 1969, 44/26779
Int. Cl. B24b *53/06*
U.S. Cl. 125—11 **5 Claims**



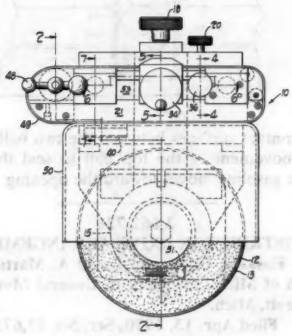
Double spherical dressing apparatus for grindstone includes cutting table slidably mounted at right angles to axis of rotation of grindstone. Swing shaft is journaled within main assembly and assembly is attached to cutting table for sliding motion along path parallel to the axis of grindstone. Swing table is connected to rotate with and relative to swing shaft. Shaft table carries dresser tool and tool rotates about axis of swing shaft and swing table to dress peripheral faces of grindstone.

3,662,732

GRINDING WHEEL DRESSER

George Banko, Euclid, and William J. Knuff, Maple Heights, both of Ohio, assignors to Brown & Sharpe Mfg. Co., Precision Park, North Kingstown, R.I.

Filed Apr. 30, 1970, Ser. No. 33,364
Int. Cl. B24b *53/06*
U.S. Cl. 125—11 R **1 Claim**



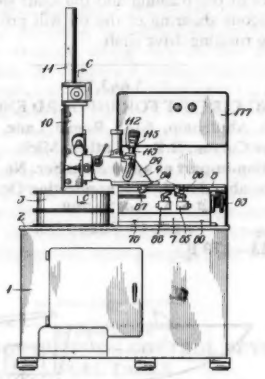
A grinding wheel dresser having a contour block mounted on the grinding wheel spindle housing for reciprocating horizontal movement above and across the upper peripheral face of the grinding wheel to provide a wheel shape that is a mirror image of the contour block.

3,662,733

ANNULAR CUTTING APPARATUS WITH WORK REMOVAL MEANS

Isamu Okamoto, Yokohama, Japan, assignor to Yoji Hattori, Tokyo, Japan

Filed Apr. 24, 1970, Ser. No. 31,645
Claims priority, application Japan, Oct. 12, 1969, 44/81375; 44/81374; 44/96933
U.S. Cl. 125—13 **8 Claims**



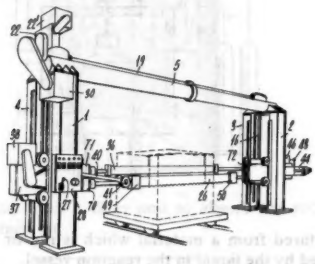
A cutting device includes an annular cutting member for cutting a crystal into slices which have smooth and parallel surfaces. The crystal is supported by a crystal holder in a rotatable head and is cut into slices which are aligned with the crystal axis with a high degree of precision. The cut slices are safely and readily removed by a takeout means which is provided beneath the annular cutting member.

3,662,734

RECIPROCATING, SENSITIVE SAW, WITH UNIDIRECTIONAL CUT, PARTICULARLY ADAPTED FOR USE WITH DIAMOND BLADES

Remo Sisler, Via Mercato, 3, Sommacampagna Verona, Italy

Filed Oct. 6, 1969, Ser. No. 863,950
Claims priority, application Italy, Oct. 4, 1968, 61287 A/68
Int. Cl. B28d *1/06*
U.S. Cl. 125—16 R 8 Claims



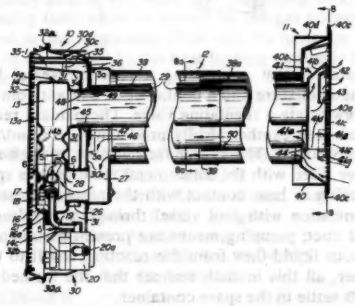
A reciprocating saw, particularly adapted for stone cutting, has unidirectional cut because the blade is raised on the return stroke. The blade follows a path which is arcuate at the end of the return stroke (FIG. 7) so as to engage the saw gradually with the workpiece. The saw is progressively fed downwardly; but when the saw encounters a particularly resistant portion of the workpiece, then the downward movement is retarded until the resistance is overcome (FIG. 9). A special recirculating roller bearing system (FIG. 11) permits heavy load on the blade without hindering vertical movement of the blade.

3,662,735

WALL-MOUNTED FLUID-FUEL FURNACE

George W. Jackson, Salt Lake City, Utah, assignor to Hydro Flame Corporation, Salt Lake City, Utah

Continuation-in-part of application Ser. No. 825,189, May 16, 1969, now abandoned. This application July 16, 1970, Ser. No. 55,378
Int. Cl. F23l *1/00;* F24h *3/02*
U.S. Cl. 126—85 B 13 Claims



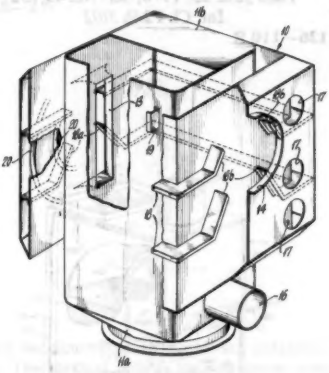
A gas or other fluid fired furnace for mounting in a wall, especially of a recreational vehicle providing living accommodations, such as so-called "campers," house trailers, and the like, where space is at a premium and special problems of vibration, proper venting, and reliability in operation are presented. An elongate, specially fabricated, Venturi-tube burner is mounted, along with a fuel feed control unit, on a removable closure plate positioned across the lower end of a front pan-like member of a shallow, rectangular, upstanding firebox. The firebox provides a combustion chamber and heat exchanger for the furnace in a compact heater unit housing and has an outwardly extending peripheral fin through which a fuel supply extends at the bottom of the firebox and is preferably canted forwardly along the top of the firebox to direct air flow and increase efficiency. A special vent unit, provided for mounting exteriorly of the spaced to be heated flush with the exterior wall face and having a lower air inlet separated from an upper gas outlet by baffles, is connected with the heater unit by air or gas flow conduits which are thermally isolated one from the other by special gasket and mounting arrangements.

3,662,736

HEAT EXCHANGE STRUCTURE FOR A HOT AIR HEATER

Thomas L. Tyson, and Edward G. Craze, Jr., both of Richmond, Va., assignors to Texaco Inc., New York, N.Y.

Filed June 1, 1970, Ser. No. 42,366
Int. Cl. F24c *3/00;* F24h *3/06*
U.S. Cl. 126—91 R 6 Claims



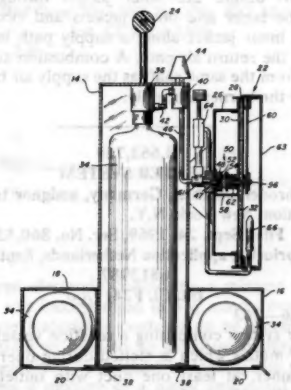
A heat exchange structure for an air heater furnace wherein the cross-over port structure from the first stage of a heat exchanger is an elongated rectangular inlet into the second stage of the heat exchanger, which has a number of spaced flanges therein for guiding the flow of the products of combustion more evenly in their passage to the outlet of the second stage.

3,662,737

CATALYTIC HEATER

Joe M. Richards, Tulsa, Okla., assignor to Nupar Manufacturing Co., Inc., Tulsa, Okla.

Filed June 29, 1970, Ser. No. 50,557
Int. Cl. F24c *3/04*
U.S. Cl. 126—92 R 4 Claims



A catalytic heater having a catalytic bed connected to a frame, incorporates an improved ignition and fuel shutoff

system. A needle valve controlling the discharge of fuel onto the catalytic bed for oxidation includes a thermosensitive needle which is preheated by a pilot light. Upon reaching a predetermined temperature, the thermosensitive needle disengages its valve seat to allow fuel from the fuel supply to discharge onto the catalytic bed where oxidation thereof occurs. Upon cooling of the catalytic bed the thermosensitive needle resets to abrogate the discharge of fuel onto the catalytic bed and thereby prevent leakage of fuel.

3,662,738

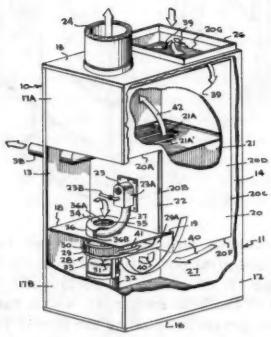
COMPACT FORCED WARM AIR FURNACE

James L. Solka, Bridgewater; Charles A. Reichelderfer, Harrisonburg; John J. Dieckmann, Harrisonburg, and Anthony M. Castello, Harrisonburg, all of Va., assignors to Dunham-Bush, Inc., Harrisonburg, Va.

Filed June 25, 1970, Ser. No. 49,732

Int. Cl. F24h *3/02*

U.S. Cl. 126—110 R **6 Claims**



A furnace for a forced warm air heating system capable of multipoise installation, including an outer jacket, an inner jacket, a heat exchanger within the inner jacket enclosing a combustion zone, and a burner assembly producing combustion within the heat exchanger. A supply air blower is arranged within the outer jacket to propel return air along a return path beside the inner jacket through the space between the inner and outer jackets and circulate the air within the inner jacket along a supply path in counterflow relation to the return air path. A combustion air blower may be driven from the same shaft as the supply air blower to provide air for the burner assembly.

3,662,739

HEATER SYSTEM

Johann Schroder, Aachen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

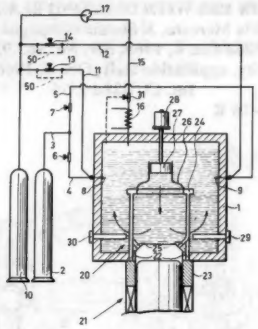
Filed Sept. 24, 1969, Ser. No. 860,521

Claims priority, application Netherlands, Sept. 30, 1968, 6813987

Int. Cl. F24j *1/00*

U.S. Cl. 126—263 **12 Claims**

A heater system comprising a reaction vessel containing a mixture of metals which is melted during operation, an oxidant container, at least one duct with outlet member for communicating the oxidant to the reaction vessel for an exothermic reaction therein with the metal mixture, and a container having an inert gas which communicates via a regulating valve with the duct between the oxidant container and the reaction vessel; the outlet member is readily cooled and



manufactured from a material which is not or substantially not wetted by the liquid in the reaction vessel.

3,662,740

HEATER SYSTEM

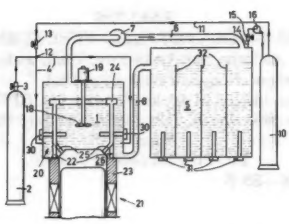
Johann Schroder, Aachen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 25, 1969, Ser. No. 860,893

Claims priority, application Netherlands, Sept. 30, 1968, 6813988

Int. Cl. F24j *1/00*

U.S. Cl. 126—263 **7 Claims**



A heater system comprising a reaction vessel having a liquid metal mixture and a container of oxidant communicating therewith via a regulating valve. The oxidant reacts with the metal melt exothermically producing solid and/or liquid reaction products. The system furthermore comprises a spare container filled with the same metal mixture, this spare container being in heat contact with the reaction vessel and in communication with said vessel through a supply duct and removal duct; pumping means are present for maintaining a continuous liquid flow from the reaction vessel to the spare container, all this in such manner that the formed reaction products settle in the spare container.

3,662,741

APPARATUS FOR HEATING INDIVIDUAL PORTIONS

Robert J. Licher, 170 N. Adams St., Sierra Madre, Calif.

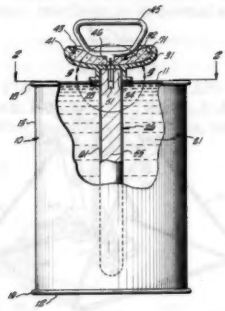
Filed Mar. 2, 1970, Ser. No. 15,673

Int. Cl. A47g *23/04*; **F24j** *1/00*

U.S. Cl. 126—263 **5 Claims**

A combustible heating element detachable from the portion after use makes central contact with the portion. The portion may be food or other substances. A metallic heat transfer sheath surrounds a combustible substance within the element. The sheath has a Teflon coating between it and the portion. A friction igniter is attached to a pull tab extending

exteriorly of the heating element. Preferably hand grips extend from an igniter base for stability while pulling the tab.



The base also holds a filter unit to absorb the products of heating combustion.

3,662,742

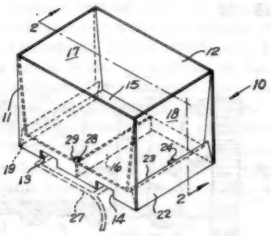
HOT TANK FOR PARTS DEGREASING

James E. Turner, P.O. Box 173, Nashville, Ark.

Filed June 26, 1970, Ser. No. 50,077

Int. Cl. E01c *19/45*

U.S. Cl. 126—344 **2 Claims**



A hot tank for parts degreasing in which a bottom wall is spaced above gas burners which are surrounded by side walls to direct the flow of heat across the bottom wall and up along an outwardly sloping end wall. The degreasing tank contains a degreasing fluid which is heated by the gas burners. Parts degreased in the degreasing fluid can be hung on the end walls so as to be dried by the heat flowing upwardly from the gas burners.

3,662,743

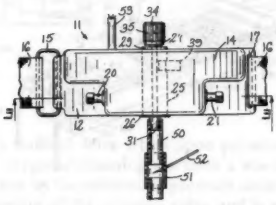
PRESSURE TRANSDUCER FOR CATHETER PRESSURE MEASUREMENT

Joseph A. Amarante, North Haven, Conn., and Robert E. Montgomery, Arcadia, Calif., assignors to Corometrics Medical Systems, Inc., North Haven, Conn.

Filed Jan. 22, 1970, Ser. No. 4,982

Int. Cl. A61b *5/00*

U.S. Cl. 128—2 S **7 Claims**



This specification primarily relates to a device for detecting pressure and pressure changes in a remote area and particularly in internal cavities through liquid coupling. A liquid filled tubing is inserted into the area to be monitored and coupled to an external transducer. A mounting for the transducer includes means to facilitate complete liquid filling of the tubing and exhaustion of air therefrom.

3,662,744

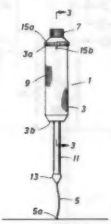
METHOD FOR MEASURING CUTANEOUS SENSORY PERCEPTION

George M. Low, Acting Administrator of the National Aeronautics and Space Administration in respect to an invention of; Robert W. Richardson, 2325 Hayes Road, Norristown, Pa., and David B. Wright, 2617 Wayland Road, Berwyn, Pa.

Filed Dec. 2, 1970, Ser. No. 94,347

Int. Cl. A61b *10/00*

U.S. Cl. 128—2 N **2 Claims**



A method for detecting and measuring cutaneous sensory perception. The method utilizes an instrument comprises an elongate tubular housing having a sleeve member extending axially from an end thereof. Mounted on the other end of the tubular housing is a vernier counter adjustment, the operating mechanism of which is disposed internally of the housing. Telescopically positioned within the sleeve is a thin wire-like member or monofilament stimulating element. One end of the monofilament stimulating element extends from the sleeve while the other end is mechanically coupled to the internal operating mechanism of the vernier counter adjustment.

3,662,745

METAL-METAL SALT ELECTRODE AND METHOD FOR MAKING THE SAME

Louis Ciro Cosentino, West Paterson, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 30, 1969, Ser. No. 837,424

Int. Cl. A61l *5/00*

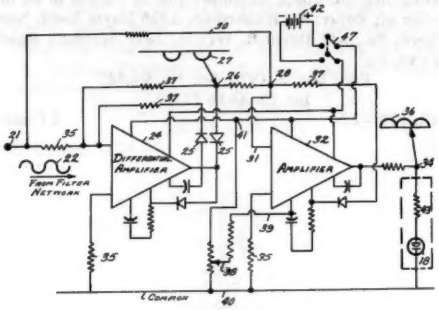
U.S. Cl. 128—2 E **5 Claims**

An improved electrode comprising a mixture of a metal and a metal salt incorporated into a matrix material. This basic electrode material is coatable on an electrically conducting substrate to provide an excellent quality, low cost electrode assembly. The method of making the same comprising forming a mixture of a metal and metal salt incorporating the resultant mixture into a matrix therefor and applying that resulting mixture to the electrically conducting substrate.

3,662,746
APPARATUS FOR DETECTING, ANALYZING AND RECORDING BIOELECTRIC POTENTIALS

Bernard Saltzberg, 3702 Octavia St., New Orleans, La.; Leonard S. Lustick, 3721 Rue Mignon St., New Orleans, La., and Robert G. Heath, 419 Walnut St., New Orleans, La.

Filed May 14, 1969, Ser. No. 824,501
Int. Cl. A61f *5/04*
U.S. Cl. 128—2.06 R **1 Claim**



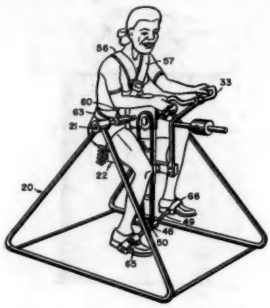
A means for monitoring electrophysiological activity is described having electrodes connected to an animal body with the output therefrom coupled to an amplifier which in turn feeds the amplified physiologically generated signal to a band pass filter network. The band pass filter is adapted to pass only those portions of the signals from the electrodes which occur in a predetermined frequency band. The filtered signal is coupled to an absolute value detector which produces a unidirectional output current signal the instantaneous amplitude of which corresponds to the instantaneous amplitude of the filter output signals. The detector output signal is coupled to a reversible microcoulometer which plates a metal from one electrode to another. The plating activity of the reversible microcoulometer produces a mass of plated material which is equivalent to the current-time integral, hence the average value, of the filter output signal. A readout device may be provided which causes the microcoulometer to operate in a reverse direction at a predetermined flow rate thereby causing a current of a predetermined value to flow. The value of the current-time integral may then be determined by determining the time required for the microcoulometer to operate in the reverse direction at the known current value. As an alternative, an event detection means may be provided which receives the signal from the electrodes and produces an output current signal of a known amplitude and duration or any signal producing a fixed, known charge for each occurrence of a predetermined wave form. In this mode of operation the reversible microcoulometer in effect operates as a counter with the amount of plating being equivalent to the number of occurrences of the predetermined wave form.

3,662,747
CIRCULATION-STIMULATING MACHINE

Chester I. Williams, 347 Greenbriar, Grand Rapids, Mich.

Filed Apr. 15, 1970, Ser. No. 28,651
Int. Cl. A61h *1/00*
U.S. Cl. 128—24 **5 Claims**

A machine for stimulating circulation in the upper portion of a human body by the effect of slow rotation on a horizontal axis through upright and inverted positions. A rotatable carrier includes a seat or standing support equipped with a retaining harness, and also includes a preferably pedal-operated drive system. A modified form of the invention includes a ring supported on parallel horizontal rollers. A driving belt surrounds the ring, and holds it against the rollers.

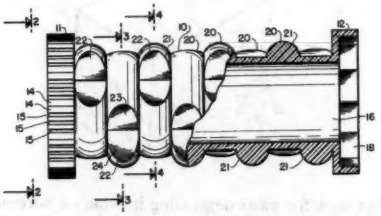


The ring has an inside diameter selected to receive an occupant in crouching position.

3,662,748
FOOT MASSAGE ROLLER

Allan C. Thurman, 44 Clinton Ave., Nyack, N.Y.

Filed Feb. 18, 1971, Ser. No. 116,561
Int. Cl. A61h *15/00*
U.S. Cl. 128—57 **7 Claims**

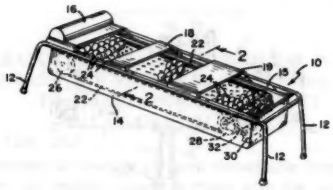


A massage roller for rolling with the sole of the foot has faceted side flanges containing serrations to grip a surface, the faceted side flanges causing a vibration of the roller on rolling it, and the roller has a smaller diameter center portion between the side flanges formed as adjacent disks with rounded edges, the disks having shallow "V" shaped notches equally spaced about their edges with adjacent disks having their notches offset relative to each other.

3,662,749
MASSAGING DEVICE

Luther G. Simjian, 7 Laurel Lane, Greenwich, Conn.

Filed Dec. 21, 1970, Ser. No. 100,165
Int. Cl. A61h *11/00*
U.S. Cl. 128—58 **22 Claims**



A massaging device comprises an array of inflated elements which are adapted to deflate under external pressure. Motive means are provided to move the array of elements

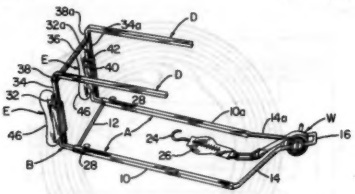
past a body portion to be massaged. A respective element, as it is distorted, rolls over the body and provides a massaging action. When the applied force ceases, the element, having a yieldable enclosure, reinflates to its normal size.

3,662,750

MULTI-PURPOSE TRACTION APPARATUS

Thor V. Jorgensen, P.O. Box 248, Frisco, Colo.

Filed Jan. 6, 1970, Ser. No. 983
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 **4 Claims**



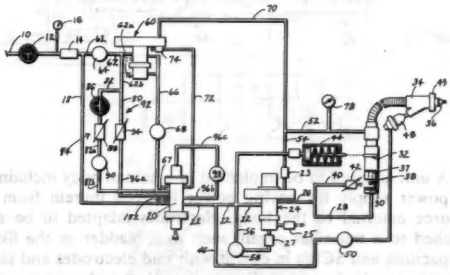
Traction apparatus for the human anatomy characterized by a main frame and a pulling device connected to one end thereof, the other end of the frame being open to provide a space for a portion of the anatomy to extend across same, and a plurality of attachments for the main frame which may be employed in various combinations to provide various abutments or loci of countertraction on various parts of the anatomy. It is a lightweight device which may be used to apply traction to entire limbs or portions of limbs, to the neck, and other portions of the anatomy. In some uses the main frame is disposed in a horizontal position but is also self supporting in a vertical position for other applications of use. The attachments may be oriented to various positions relative to the main frame and are detachable therefrom to render the apparatus compact, whereby it may be readily transported.

3,662,751

AUTOMATIC RESPIRATOR-INHALATION THERAPY DEVICE

Clare E. Barkalow, Comstock Park, and Ilden R. Folkerth, Sparta, both of Mich., assignors to Michigan Instruments, Inc., Grand Rapids, Mich.

Filed May 20, 1970, Ser. No. 38,948
Int. Cl. A62b *7/04*
U.S. Cl. 128—145.8 **18 Claims**



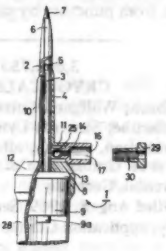
A primary control valve when open permits the flow of a pressurized oxygen containing gas from a source to a patient adapter for use by the patient. A pressure control means controls the opening of the primary valve and is responsive to a sub-ambient pressure in the adapter caused by initial patient inhalation to actuate the primary valve to an open position. A pair of adjustable timing mechanisms control the lapse time for the primary valve in the open or closed position. The timing mechanism controlling the time during which the primary valve is closed is subservient to the pressure control means so that patient inhalation causes the valve to open prior to the preselected lapse time. It may also be turned off to permit gas flow only as a result of patient inhalation. A pressure regulator is also provided to prevent flow pressures in the adapter above a predetermined level. A mechanism is also provided to adjust the level of output flow to meet varying patient needs.

3,662,752

INFUSION DEVICE

Kousou Yokoyama, Hiroshima, Japan, assignor to Japan Medical Supply Co., Ltd., Hiroshima-ken, Japan

Filed July 8, 1970, Ser. No. 53,102
Claims priority, application Japan, July 12, 1969, 44/65523
Int. Cl. A61m *05/00*
U.S. Cl. 128—214 R **1 Claim**



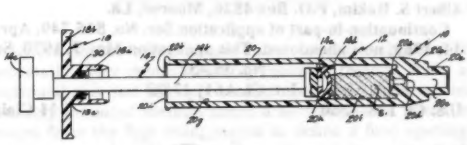
An infusion device in which a back-flow check valve is provided at an opening communicated with an air and medical fluid injection groove formed along the length of the needle body, said check valve being made of a flexible material such as rubber or soft plastics and having its forward end formed spherically or in other similar configuration, with a slit being formed at the front thereof, and whereby either air or liquid medicine, as the case may be, caused to flow in the injected direction when so desired.

3,662,753

SYRINGE

Kitchener B. Tassell, 4048 Brenton Road, Grand Rapids, Mich.

Filed May 25, 1970, Ser. No. 40,197
Int. Cl. A61m *5/00*
U.S. Cl. 128—218 M **9 Claims**

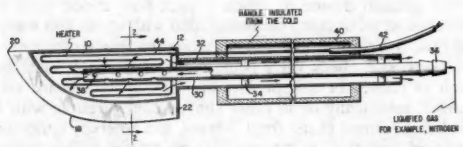


A syringe assembly enabling mixed discharge of substances retained in separated condition until intended use, employing a plunger and barrel arrangement that retains the substances separated during storage, allows mixing thereof prior to discharge, and causes discharge of the mixed substances.

3,662,754
INJECTION APPARATUS
William X. Halloran, 440 Fair Drive, Costa Mesa, Calif.
Filed May 4, 1970, Ser. No. 34,179
Int. Cl. A61m 5/00
U.S. Cl. 128—221 8 Claims

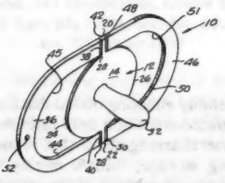
Injection apparatus including a needle formed on one extremity with a point and connected on its opposite end with coupling means for coupling to a syringe or the like. A protective sleeve is telescoped over the one extremity of the needle and has one end of a pusher connected therewith, such pusher projecting rearwardly along the needle shank and being connected on its rear extremity with a finger-grasp handle whereby the sleeve may be telescoped rearwardly on such extremity of the needle, the point inserted through the wall of a patient's vein and the needle projected down such vein. Thereafter, the handle may be pushed to telescope the sleeve outwardly over the needle point to thereby protect the wall of the vein from puncture by said point.

3,662,755
CRYO-SCALPEL
Robert Rautenbach; Wolfgang Lutzeyer, both of Aachen; Udo Werner, Karlsruhe; Stravros Lymberopoulos, Aachen, and Hubert Zimmerman, Aachen, all of Germany, assignors to Leybold-Heraeus GmbH & Co. Kommandit-Gesellschaft, Cologne-Bayental, Germany
Filed Aug. 8, 1969, Ser. No. 3,258
Claims priority, application Germany, Aug. 8, 1968, P 17 66 906.6
Int. Cl. A61b 17/38, 17/32
U.S. Cl. 128—303.1 4 Claims



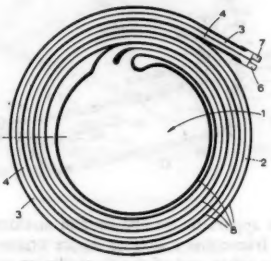
A method of cryogenic surgery and a scalpel suitable for the practice of the method. The scalpel has a hollow chamber within which a fluid medium may be injected, there being knife blade means in heat transfer contact therewith. In the practice of the method the scalpel is cooled by injection of an appropriate fluid. Thereafter animal tissue is cut with the scalpel thereby freezing the cut areas. The knife is heated as necessary to permit detachment of the scalpel from the frozen areas.

3,662,756
PACIFIERS
Albert S. Hakim, P.O. Box 4826, Monroe, La.
Continuation-in-part of application Ser. No. 815,749, Apr. 14, 1969, now abandoned. This application May 7, 1970, Ser. No. 35,432
Int. Cl. A61j 17/00
U.S. Cl. 128—360 11 Claims



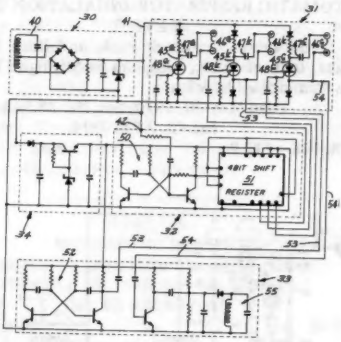
Pacifiers of integral construction have a shield with handle portions forming co-planar extensions which increase the overall shield area in one position and which are foldable to second positions to form a handle.

3,662,757
DIATHERMY PLATE ELECTRODE
John Harold Blackett, London, England, assignor to Matburn (Holdings) Limited, London, England
Filed Apr. 14, 1970, Ser. No. 28,311
Claims priority, application Great Britain, Apr. 25, 1969, 21,180/69
Int. Cl. A61n 1/06
U.S. Cl. 128—416 6 Claims



This invention relates to a plate electrode for use in surgical diathermy or electrosurgical apparatus. The electrode is a thin flexible sheet of metal foil backed by a flexible film of plastics material.

3,662,758
STIMULATOR APPARATUS FOR MUSCULAR ORGANS WITH EXTERNAL TRANSMITTER AND IMPLANTABLE RECEIVER
Eugene G. Glover, Minneapolis, Minn., assignor to Mentor Corporation, Minneapolis, Minn.
Filed June 30, 1969, Ser. No. 837,701
Int. Cl. A61m 1/36
U.S. Cl. 128—419 E 4 Claims



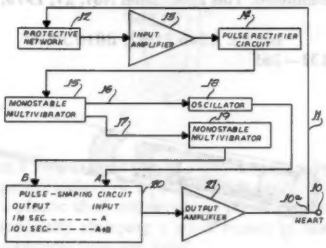
A unit adapted to be implanted in a human body including a power supply for having power induced therein from a source external of the body, electrodes adapted to be attached to a muscular organ, such as a bladder or the like, capacitors and SCR's in circuit with said electrodes and said power supply for normally storing electrical energy and discharging said electrical energy through the electrodes upon conduction of the SCR's, triggering circuitry connected between the power supply and the SCR's for triggering the SCR's when the power induced in the power supply is temporarily interrupted and an FM transmitter connected to the power supply and between a pair of spaced apart electrodes so as to transmit a signal varying in frequency according to the resistance of the material between the electrodes; and an external control unit including means for inducing power into the internal power supply and controllable to periodically

and temporarily remove power to control the energy supplied to the electrodes and an FM receiver with indicating means attached to provide an indication as to the operation of the muscular organ.

3,662,759
CARDIAC PACER SYSTEM

Laurence L. Dabolt, Newport Beach, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Sept. 22, 1969, Ser. No. 859,900
Int. Cl. A61n 1/36
U.S. Cl. 128—419 P **15 Claims**

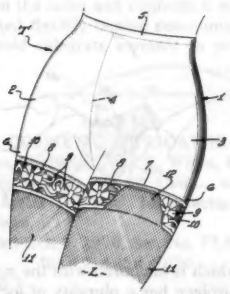


An implanted pacer system includes a resettable oscillator for generating a train of pulses having a period slightly greater than the period of a natural heartbeat. The pulses generated in the oscillator are coupled to a pulse shaper network which transmits pulses to an electrode contacting the heart. If no natural heartbeat is sensed, the oscillator operates at its natural frequency and the shaper network transmits heart-stimulating pulses to the electrodes. If a natural heartbeat is detected, the oscillator is reset and timing circuitry in the shaper network is modified so that a non-stimulating pulse is transmitted to the electrode. The non-stimulating pulses are detectable by a receiver outside the body to permit an examining physician to ascertain whether the pacer system is operative when the heart is functioning normally even though the system is non-competing. Further, the non-stimulating pulses do not produce an artifact on an EKG machine monitoring the patient's heartbeat, and negligible energy is dissipated in the non-stimulating pulses.

3,662,760
PANTY GIRDLE WITH DECORATIVE HOSE SUPPORT

Jan J. Erteszek, Los Angeles, Calif., assignor to Olga Company, Van Nuys, Calif.

Filed June 19, 1970, Ser. No. 47,818
Int. Cl. A41c 1/00
U.S. Cl. 128—535 **4 Claims**

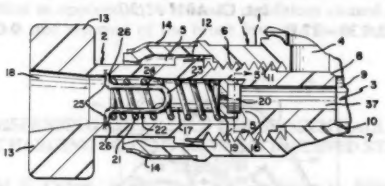


Panty girdle in which the leg portions are terminally edged by ornamentally patterned lace fabric bands adapted to support a wearer's hose, the bands elastically encircling the wearer's leg and having hose gripping adhesive distributed on their inside surfaces in a manner congruent with ornamental aspects of the bands.

3,662,761
VALVE STRUCTURE WITH A U-SHAPED SPRING RETAINER

Joseph Willard Hoffman, Liverpool, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of application Ser. No. 846,516, July 31, 1969, now abandoned. This application Mar. 23, 1970, Ser. No. 21,691
Int. Cl. F16k 17/04
U.S. Cl. 137—543.19 **7 Claims**

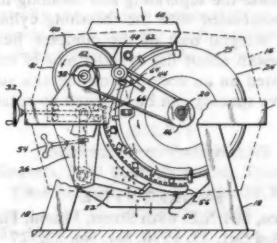


A valve has a body provided with a passageway therethrough. A valve seat is located along the passageway. A sealing member is biased into sealing engagement with the valve seat via a spring member. A U-shaped retaining member is disposed in the passageway and in engagement with the spring member; it has outwardly directed sharp ends that dig into the wall of the passageway to seat the sealing member onto the valve seat in accordance with a prescribed pressure under which the spring member is placed by the retaining member. A modification of a sealing skirt provides better sealing characteristics.

3,662,762
CORN SHELLER

Ronald W. Brass, Ackley, Iowa, assignor to Iowa State University Research Foundation, Ames, Iowa

Filed Aug. 31, 1970, Ser. No. 68,375
Int. Cl. A01f 11/06
U.S. Cl. 130—6 **4 Claims**



A corn sheller comprising a frame means having a first pneumatic roller means rotatably mounted thereon about a horizontal axis and having a second pneumatic roller means rotatably mounted thereon about a horizontal axis which is spaced from the first roller means to define a feed opening therebetween. A feed hopper is positioned above the feed opening for feeding corn ears thereto. An arcuate concave means is positioned below the feed opening and extends downwardly therefrom in a spaced relationship with respect to the periphery of the first roller means. A power means is connected to the first and second roller means for rotating the same in the same direction whereby the first and second roller means will cause a corn ear to pass downwardly through the feed opening so that the longitudinal axis of the

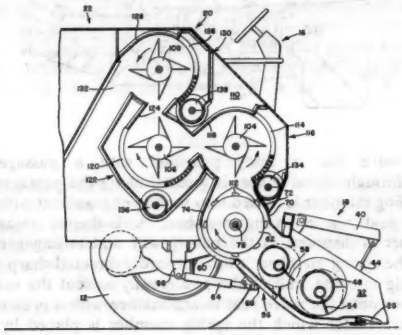
corn ear will be parallel to the rotational axis of the first roller means. The space between the concave means and the periphery of the first roller means is such that radial compressive forces are applied to the corn ear to loosen the kernels thereon without damage thereto. The concave means is comprised of a plurality of parallel rods which are adapted to cooperate with the first roller means to apply the radial compressive forces to the corn ear.

3,662,763

COMBINE

Henry Hoyt Denison, Moline, Ill., and Roy Edwards Harrington, New Delhi, India, assignors to Deere & Company, Moline, Ill.

Filed July 22, 1970, Ser. No. 57,234
Int. Cl. A01f *12/20*
U.S. Cl. 130—27 P **9 Claims**



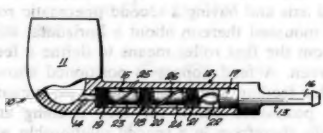
A self-propelled combine having a rotary separating mechanism mounted forwardly thereon including a threshing cylinder and associated closed concave which initially thresh the crop, and a series of three separating impellers and associated open concaves which cooperate to move the threshed crop along a serpentine path while separating the grain from the straw. The grain is collected from each of the open concaves and delivered first to a rotary cleaning mechanism mounted on the extreme rear of the combine, then to a clean grain storage tank mounted on the combine frame intermediate the separating and cleaning mechanisms. The concave associated with the threshing cylinder is constructed as an integral part of the combine header and is swingable therewith about the cylinder axis of rotation. The header is mounted on an eccentric on the axis such that the cylinder-concave spacing can be adjusted by rotating the eccentric.

3,662,764

SMOKER'S PIPE

Francisco Blanco, 501 N.E. 69th Street, Miami, Fla.

Filed Oct. 23, 1970, Ser. No. 83,527
Int. Cl. A24f *07/04*
U.S. Cl. 131—207 **5 Claims**



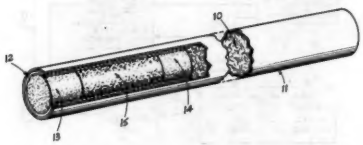
A smoker's pipe having an axial cylindrical bore within the pipe shank portion wherein a plurality of filter elements are removably disposed for filtering, cooling and absorbing moisture. The filter elements are of cylindrical shape and supported in spaced relation along and within the pipe shank by means of a helical compression spring having stretched-out portions providing spaced gaps within which the filter elements are removably constrained. A wire loop handle at the outer end of the spring facilitates manual insertion. A removable friction-fit bit at the outer end of the pipe shank abuttingly constrains the spring-filter assembly in place.

3,662,765

SMOKE FILTER

Robert F. Clark, Schenectady, N.Y., assignor to General Electric Company

Continuation of application Ser. No. 749,380, Aug. 1, 1968, now abandoned. This application Nov. 27, 1970, Ser. No. 93,504
Int. Cl. A24b *15/02*; **B01d** *39/00*
U.S. Cl. 131—265 **18 Claims**



A porous filter is provided which is effective for removing undesirable materials such as particulate matter from smoke, including tobacco smoke, comprising an organopolysiloxane disposed in the conduit through which the smoke is forced to pass, the said filter being formed of an organopolysiloxane of the formula

$$(R)_a(R')_bSiO(4-a-b)/2$$

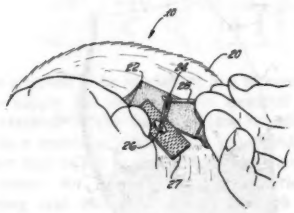
Where R is a monovalent polar organic radical selected from the group consisting of cyanalkyl, fluoroalkyl, nitroalkyl, arylsulfonylalkyl, carbamylalkyl, carbalkoxyl, uriedoalkyl and nitroaryl, R′ is a monovalent hydrocarbon radical, *a* has a value equal to 0.1 to 3, inclusive, *b* has a value of 0 to 2.5 inclusive, and the sum of *a*+*b* has a value equal to 1 to 3, inclusive, mixed with up to about 300 parts of filler. The filter can be used in combination with a cigarette, or as an anti-air pollution device. The organopolysiloxane can also be carried on a porous substrate such as polyurethane or polyvinyl chloride.

3,662,766

METHOD OF ATTACHING A HAIRPIECE

Ralph Maassen, and Alex Pollock, both of 6381 Hollywood Blvd., Hollywood, Calif.

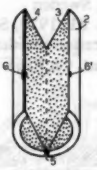
Filed Mar. 10, 1971, Ser. No. 122,966
Int. Cl. A41g *5/00*
U.S. Cl. 132—5 **8 Claims**



A hairpiece which is anchored with the surrounding natural hair. The hairpiece has a plurality of locking devices attached to its base. The locking devices have a first section, which is attached to the hairpiece, and a second section which is adapted to being lockingly engaged with the first section. The second section is attached to the natural hair by

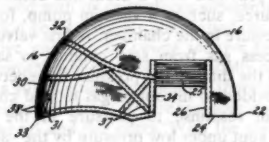
means which permits adjustment of the attachment between the natural hair and the second section to compensate for growth of the natural hair.

3,662,767
HAIR DYEING AID
Irene Murtha, 147-20 34th Avenue, Flushing, N.Y.
Filed Apr. 2, 1971, Ser. No. 130,651
Int. Cl. A45d *1/06*
U.S. Cl. 132—9 **6 Claims**



A woman's hair is held up in small bunches by a novel clamp to permit selective dyeing at the roots. The clamp comprises a plastic shell with resilient plastic opposed members for frictionally clamping a small bunch of hair and for holding it outwardly from the head.

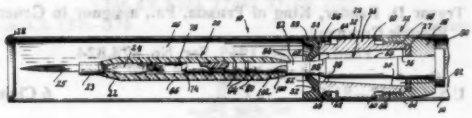
3,662,768
WIG CONSTRUCTION HAVING SYNTHETIC RESINOUS SUBSTRATE ELEMENT
Raphael Klugmann, 43 West 16th St., New York, N.Y.
Filed Jan. 21, 1971, Ser. No. 108,306
Int. Cl. A41g *3/00*
U.S. Cl. 132—53 **1 Claim**



A wig construction in which the forwardly disposed portions of the hair strands may be parted at a desired laterally disposed location to give the appearance of the scalp of the wearer at the parting line. The wig includes a rearwardly extending foundation element of conventional netted textile construction defining a forward edge, and a laminated substrate element interconnected to said forward edge at a rearward edge thereof, and including an upper lamina of colored synthetic resinous material to which hair strands are tufted, and a lower lamina of relatively stiff textile netting interconnected to said upper lamina at at least the peripheral edges thereof to stiffen the same and conform it to the head of the wearer. Integrated flexible boning communicates with a forward edge of said substrate element to prevent said edge from curling.

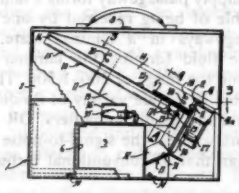
3,662,769
COSMETIC APPLICATOR
Martin M. Vasas, Fairfield; John C. White, Easton, and Paul M. Alexander, Newton, all of Conn., assignors to The Bridgeport Metal Goods Manufacturing Company, Bridgeport, Conn.
Filed Oct. 5, 1970, Ser. No. 77,978
Int. Cl. A45d *40/26*
U.S. Cl. 132—88.7 **9 Claims**

A cosmetic applicator including a normally liquid cosmetic containing reservoir and a self-contained brush. The open end of the reservoir is closed by a centrally apertured annular resilient diaphragm which provides means for sealing the reservoir against leakage and for wiping excess cosmetic from the bristles of the brush when the latter is being removed from the reservoir. The brush includes a two-part shaft with a peripheral depression defined intermediate the two parts and which projects through the diaphragm when



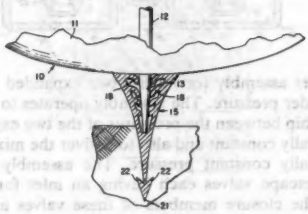
the applicator is not in use. The depression is dimensioned such as to permit the diaphragm to maintain an unstressed condition as opposed to its stressed conditions caused during insertion and removal of the brush into and from the reservoir.

3,662,770
DISPENSING APPARATUS FOR SEQUENTIALLY DISCHARGING TOKENS FROM AN INCLINED STACK OF TOKENS
Ronald S. Cohen, Milwaukee, Wis., assignor to Behavioral Controls, Inc., Milwaukee, Wis.
Filed Nov. 29, 1968, Ser. No. 779,836
Int. Cl. G07d *1/00*
U.S. Cl. 133—5 R **10 Claims**



This disclosure relates to a coin dispenser. A "U" shaped tray is angularly mounted with the lower end slightly spaced from a stop plate to define a discharge opening. The tray opens upwardly with the coins disposed in the tray with one or more backing balls continuously urging them downwardly into clamping engagement against the stop plate. A wiper blade is centrally secured to a motor shaft to one side of the discharge opening such that the shaft rotation moves the opposite ends of the blade through the discharge space or opening.

3,662,771
UMBRELLA ATTACHMENT
Albert W. Gravatt, 2401 South Broad St., Trenton, N.J.
Filed May 22, 1970, Ser. No. 39,782
Int. Cl. A45b *1/00*, *11/00*
U.S. Cl. 135—16 **4 Claims**



An attachment for an umbrella wherein a receiver engages the stick extension of the umbrella and is provided with an

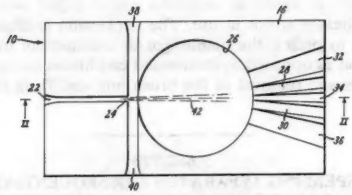
impaling member for engagement in a ground surface, in order that the umbrella be temporarily held in position during nonuse.

3,662,772

LAMINAR FLUIDIC DEVICES

Trevor D. Reader, King of Prussia, Pa., assignor to General Electric Company

Filed Nov. 21, 1969, Ser. No. 878,824
Int. Cl. F15c *18/18, 1/00*
U.S. Cl. 137—81.5 **6 Claims**



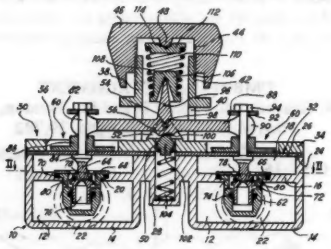
Fluidic devices wherein the fluid stream or streams acting therein are always in the laminar state. The important elements of each fluidic device, which include one or more supply passageways, one or more receiver passageways, vents, a cavity and possibly one or more control passageways, are of a configuration and location such that fluid flowing through each supply passageway forms a laminar fluid stream which is capable of being received by one or more of the receiver passageways in a laminar state. The Reynolds number of the fluid forming the laminar fluid stream is preferably within the range of 200–1,500. The subject invention is applicable to a wide variety of fluidic devices including proportional and digital amplifiers, OR and AND gates, and rate sensors wherein the signal-to-noise ratio is substantially lower than that of conventional turbulent flow fluidic devices.

3,662,773

MIXER ASSEMBLIES

Jean-Pierre Nicolas, La Chiquita-Gairout Superior -06/, Nice, France

Filed May 27, 1970, Ser. No. 40,971
Claims priority, application France, May 27, 1969, 6917254; 6945390
U.S. Cl. 137—100 **7 Claims**



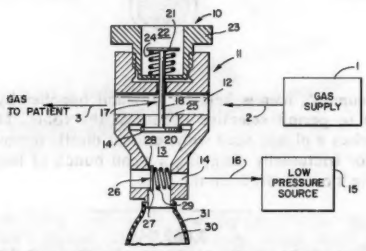
A mixer assembly for mixing two expanded and separate fluids under pressure. The assembly operates to maintain the relationship between the pressures of the two expanded fluids substantially constant and also to deliver the mixed fluids at a substantially constant pressure. The assembly comprises a pair of escape valves each having an inlet for one of said fluids. The closure members of these valves are associated with membranees and are operatively interconnected by means such as a beam which permits the valve members to be displaced in relatively opposed directions when the supply pressure of the two fluids vary. The beam or other form of connecting means is acted upon by a resilient element which is compressed or expanded when the supply pressures of the two fluids respectively increase or decrease thus moving the beam in the direction to close or open the escape valves thereby stabilizing the fluids pressures.

3,662,774

GAS EVACUATOR FOR BREATHING APPARATUS

Dag Olof Alfred Johannisson, Lidingo, and Gustaf Silas Staffan Lundberg, Ystad, both of Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed Aug. 31, 1970, Ser. No. 68,364
Claims priority, application Sweden, Sept. 9, 1969, 12384/69
Int. Cl. F16k *45/02*
U.S. Cl. 137—115 **7 Claims**



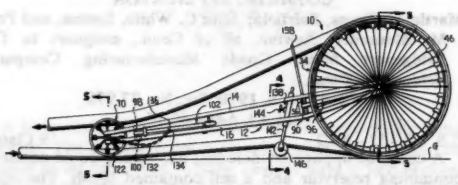
A gas evacuator for removing excess gas conveyed to a patient through a duct from a gas supply. The device includes a conduit connectable to the gas duct to convey the gas from one portion of the duct to another portion thereof. A chamber is provided with a drain line connectable to a low pressure source, such as a vacuum pump, for maintaining a reduced pressure in the chamber. A first valve is provided for venting excess gas from said conduit to said chamber in response to the differential pressure therebetween. A second valve is provided to introduce gas to said chamber from atmosphere in response to pressure in the chamber. The chamber is kept under low pressure by the vacuum pump. At a desired value of low pressure, the second valve opens to maintain that pressure in the chamber. If excess gas is present in the duct, the first valve opens venting that excess gas to the chamber until the excess gas is removed. The vented gas is removed through the drain line. In the event of a temporary increase in pressure in the chamber above the mentioned desired value, the second valve closes thus ensuring that the excess gas removed from the duct is not vented to atmosphere in the area adjacent the device.

3,662,775

VERTICAL LOOPER WHEEL FOR IRRIGATION HOSE

Warren R. Clark, Box 323, Eastville, Va.; Warren G. Clark, Box 215, Cheriton, Va., and Page N. Scott, R.F.D., Cape Charles, Va.

Filed Dec. 7, 1970, Ser. No. 95,654
Int. Cl. B05b *9/02*; E01h *3/02*
U.S. Cl. 137—344 **10 Claims**



A traveling looper wheel for vertically lifting and reverting field hose connected with and towed by conventional mobile

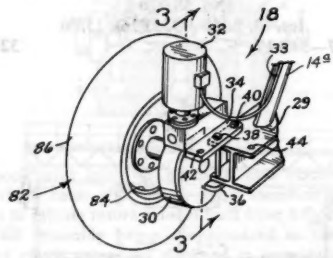
field water sprinkling means providing field irrigation, the looper wheel preventing damage to planted crops.

3,662,776

SELF-PROPELLED SPRINKLER SYSTEM

Raymond W. Bryant, Seattle, Wash., and Clifford V. Engel, Beaverton, Oreg., assignors to Said Engel, by said Bryant

Filed Feb. 17, 1970, Ser. No. 11,951
Int. Cl. B05b 9/02; E01h 3/02
U.S. Cl. 137—344 6 Claims



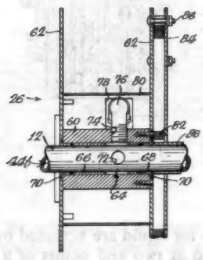
A self-propelled sprinkler system including an elongated conduit supported, by an upright support frame, in a substantially horizontal position above the ground. A self-contained drive unit is pivotally connected to a lower portion of the support frame for swinging about an upright axis relative to the frame. The drive unit includes a motor, a ground-engaging wheel disposed with its central axis substantially horizontal, and reduction gears drivingly connecting the motor to the wheel. The drive unit can be swung relative to the support frame to position the wheel's axis substantially parallel to the conduit, or at a substantial angle relative thereto, and it may be locked in either position. A disengagable coupling interconnects the wheel and the gears. With the coupling disengaged the wheel rotates freely accommodating towing of the system.

3,662,777

TOOL CART

Larry D. Plunkett, Crystal Lake, and Robert J. Massion, Des Plaines, both of Ill., assignors to Signode Corporation

Filed July 28, 1970, Ser. No. 58,904
Int. Cl. B65h 75/36
U.S. Cl. 137—355.17 4 Claims



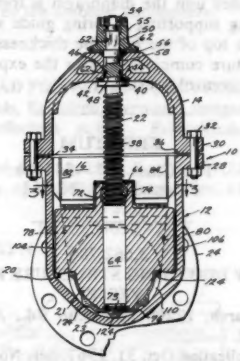
A cart for transporting fluid actuated devices and having an axle rotatably supporting wheels on opposite ends thereof with the axle defining a fluid flow passage for supplying actuating fluid to the respective devices.

3,662,778

GATE VALVE STRUCTURE

Wilbur R. Leopold, Jr.; John J. Smith; Frank C. Hackman; Lawrence F. Luckenbill, and Joseph L. Daghe, all of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Filed Jan. 5, 1971, Ser. No. 104,116
Int. Cl. F16k 27/00, 31/50, 3/00
U.S. Cl. 137—375 51 Claims



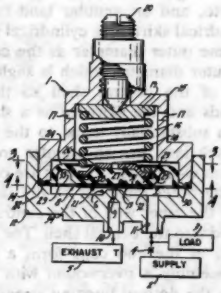
A gate valve structure for use in mains carrying a fluid under high pressure, the fluid being of the type which could possibly cause corrosion to the elements of the gate valve structure including the casing. An improved valve gate member is provided which permits operation from closed to open position and vice versa with a minimum of torque and with maximum holding power in the closed position. The valve gate member is designed so that there is unobstructed communication between the ports of the valve casing to thereby reduce turbulence and currents within the valve structure and thus effectively reduce corrosion deposits and collection of debris within the structure. The valve gate member is a flat and hollow chamber for reception of a valve operating stem and means are provided to completely protect the valve gate member and the track in which it operates from corrosion and possible damage.

3,662,779

BLEED TYPE FLUID PRESSURE CONTROL APPARATUS AND DIAPHRAGM UNIT THEREFOR

Urban A. Weber, Brookfield, and George J. Janu, Milwaukee, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Jan. 13, 1971, Ser. No. 106,185
Int. Cl. F16k 17/06, 31/12
U.S. Cl. 137—489 36 Claims



A pneumatic diaphragm control includes a diaphragm unit overlying a nozzle with a chamber connected to a fluid supply and to a load. The diaphragm unit is biased toward

the nozzle by a coil spring or a fluid pressure. The diaphragm unit includes a rubber diaphragm, a central nozzle seal portion and an outer clamp ring connected by a single intermediate convolute portion. A single piece flat spring includes a peripheral clamp ring connected to a center member by three integral arms which extend circumferentially and radially between the inner and outer portions. The bottom surface of the diaphragm's seal portion is bonded by a suitable adhesive to the corresponding center portion of the spring. In the spring loaded unit the diaphragm is formed with an integral back lug supporting a spring guide such that spring force is on the top of the lug. The thickness of the lug provides temperature compensation for the expansion and contraction of the control housing or body.

ERRATUM

For Class 137—543 see:
Patent No. 3,662,761

3,662,780

FLUID FLOW DIRECTING STRUCTURE FOR PRESSURE VESSEL

Robert E. Marsh, 12200 Montecito Rd., Apt. D-309, Seal Beach, Calif.

Original application Oct. 31, 1967, Ser. No. 679,304, now Patent No. 3,557,827, dated Jan. 26, 1971. Divided and this application May 25, 1970, Ser. No. 48,680

Int. Cl. B01d *27/12*

U.S. Cl. 137—590 **8 Claims**

A light weight filament wound pressure vessel. The vessel includes a central cylindrical shell and a pair of end caps adapted to fit into the opposite ends of the shell. Each of the end caps includes a convex, dome-like upper portion, a cylindrical skirt depending from the upper portion and integrally connected thereto, and an annular land connected to the edge of the cylindrical skirt. The cylindrical skirts are of substantially the same outer diameter as the central shell. The lands have an outer diameter which is slightly less than the inner diameter of the central shell so that the junction between the lands and the skirt forms a shoulder having a radial dimension substantially equal to the thickness of the central shell. Each land has an annular groove therein for carrying a resilient O-ring. The O-rings are of a slightly larger diameter than the outer diameter of the lands so that they sealingly engage the inner wall of the central shell when the lands are inserted into the central shell. The central shell and cylindrical skirts of the end caps form a smooth external junction. The assembly is overwound with a fiberglass filament to provide the desired bursting strength of the vessel. The lands may be integrally connected to the skirts or mounted on a collector ring. In one embodiment of the pressure vessel of this invention a fluid flow directing means is integrally connected to the internal surfaces of one of the end caps for guiding fluids through the vessel and eliminating "channeling." This embodiment of the invention is particularly adapted for use as a water conditioning tank.

3,662,781

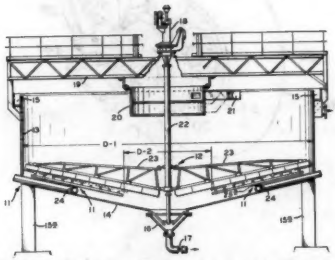
MEANS FOR THE SUBMERGED INTRODUCTION OF A FLUID INTO A BODY OF LIQUID

Patsy J. Figliola, Stamford, and Douglas J. McCallum, Jr., Norwalk, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Continuation-in-part of application Ser. No. 699,012, Jan. 11, 1968, now abandoned. This application July 24, 1970, Ser. No. 58,070

Int. Cl. B05b *1/32;* **F16k** *15/06*

U.S. Cl. 137—543.17 **32 Claims**



Improved system for the submerged introduction and distribution of a fluid into a body of liquid, for instance in an apparatus for the hydraulic upflow classification and/or desliming of metallurgical pulps or the like in a teeter bed, employing self-cleaning nozzles in the form of resiliently yieldable check valves.

3,662,782

DISTRIBUTING DEVICES FOR FLUID UNDER PRESSURE

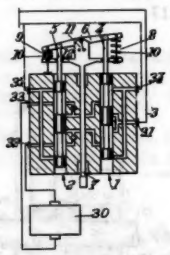
Marcel Rene Schott, Bois-Colombes, France, assignor to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation, Paris, France

Filed Feb. 16, 1971, Ser. No. 115,470

Claims priority, application France, Feb. 25, 1970, 7006811

Int. Cl. F15b *13/04;* **F16k** *11/10*

U.S. Cl. 137—596 **9 Claims**



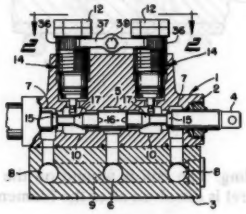
Two distributors for liquid are actuated by two lateral rods which are provided at two end points of a cross bar whose middle point is provided on a central rod. Two threshold mechanical systems are provided at the level of the two hinges on the cross bar on the lateral rods. The device is useful for controlling a double-acting jack and especially in systems for actuating the control surfaces of an aircraft.

3,662,783

SPOOL VALVE ASSEMBLY

Hugh J. Stacey, Willoughby, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Feb. 2, 1970, Ser. No. 7,836
Int. Cl. F16k 11/07
U.S. Cl. 137—596.14 8 Claims



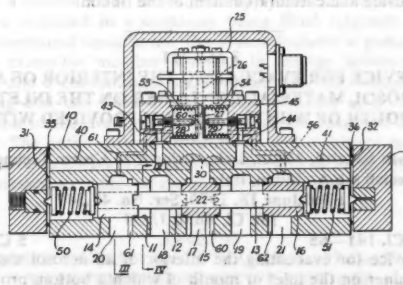
A spool valve assembly having a flow control and cam spool which cams pilot check valve members to unseated position to initiate return flow of fluid from a fluid motor to a tank, said assembly being characterized in that the pilot operated check valves are disposed in cartridges which are adjustable in the valve housing to enable accurate positioning of the cam operated pilot check valves with respect to the spool cams. The assembly herein is further characterized in that although the main check valve is opened by differential fluid pressure upon cam opening of the pilot check valve, the main check valve is prevented from closing so long as the valve spool is in operating position. The assembly herein also has means to prevent buildup of pressure in the valve chambers upstream of the cam operated check valves so that fluid leaking past the spool land at the pressure inlet is vented to the tank via the upstream chambers aforesaid. Still another characterizing feature of the invention is that the pilot operated check valves have chatter or flutter preventing means which precludes inadvertent closing of that check valve which is on the pressure side due to pressure surges or pulsations, or other sudden rise in pressure between the fluid motor and the spool valve assembly.

3,662,784

TORQUE MOTOR CONTROLLED FLUID VALVE

John M. Perhach, Buffalo, N.Y., assignor to Glar-Ban Corporation, Buffalo, N.Y.

Filed Nov. 2, 1970, Ser. No. 86,134
Int. Cl. F15f 5/00; F16k 11/07
U.S. Cl. 137—625.62 7 Claims



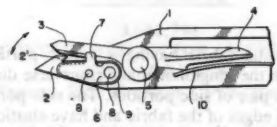
Movement of the armature of a torque motor controls the position of the spool valve element of a four-way valve. A valve member carried by the armature lies between a pair of nozzles leading from the pressure port of the four-way valve and balanced springs normally center the spool valve element. Movement of the armature moves the valve carried thereby closer to one of the nozzles and farther from the other and this causes unbalanced dynamic fluid pressure in the passages leading to the nozzles which pressures are applied to opposite ends of the spool valve and thus moves the spool valve in one direction or the other from its neutral central position. Bellows members extend from opposite faces of the valve carried by the armature of the torque motor to enclose the region in which the nozzles discharge thus effectively isolating the nozzle discharge fluids from the torque motor itself and the ambient atmosphere to prevent egress of the fluid being controlled and to prevent contamination or dilution of the fluid by the ambient atmosphere.

3,662,785

GRIPPER HEAD FOR USE IN A SHUTTLELESS LOOM

Nikolaus Kokkinis, Eriskirch, Germany, assignor to Lindauer Dornier Gesellschaft m.b.H., Friedrichshafen/Bodensee, Germany

Filed Apr. 10, 1970, Ser. No. 27,225
Claims priority, application Germany, Nov. 11, 1969, P 19 565 53.8
Int. Cl. D03d 47/20
U.S. Cl. 139—122 N 1 Claim



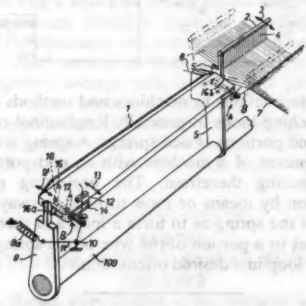
This invention relates to an improved gripper head for use in a shuttleless loom, the gripper head having a pair of clamping jaws for weft thread and the improvement comprising resilient ring-shaped covering means on one of said jaws.

3,662,786

WEFT THREAD INSERTING METHOD AND APPARATUS

Allan William Henry Porter, Stosswald, Switzerland, assignor to Adolph Saurer, Ltd., Arbon, Switzerland

Filed Nov. 4, 1969, Ser. No. 873,996
Claims priority, application Switzerland, Nov. 5, 1968, 16482/68
Int. Cl. D03d 47/24
U.S. Cl. 139—125 10 Claims



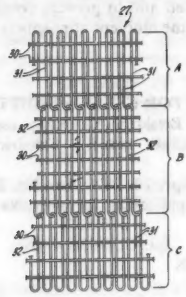
Weft threads are inserted into successive warp sheds in opposite directions by a shuttle which has at both ends frictional holding means which can be opened and closed, and frictionally guide in the closed position the weft thread along a tortuous path without clamping the weft thread. The respective trailing holding means receives and holds the inserted weft thread for the next pick and is automatically opened at the end of the same to release this thread at the same time as the previously leading holding means is opened and closed to receive and hold a new weft thread for the subsequent following pick when the leading and trailing positions of the two holding means are reversed.

3,662,787

NARROW ELASTIC FABRIC AND METHOD OF MAKING THE SAME

Antonio Schiappa, Pawtucket, and Richard E. Goff, Barrington, both of R.I., assignors to Johnson & Johnson

Filed June 26, 1970, Ser. No. 50,126
Int. Cl. D03d 15/08
U.S. Cl. 139—422 5 Claims



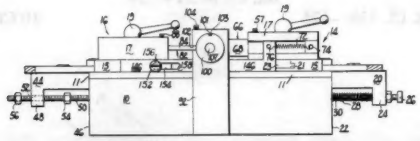
A narrow elastic fabric having a center portion having elasticity in both the longitudinal and transverse directions of the fabric and a pair of side portions. The side portions form the longitudinal edges of the fabric and have elasticity in only the longitudinal direction of the fabric. A method for manufacturing such a narrow elastic fabric by weaving elastic filling yarns in the center portion of the fabric and non-elastic filling yarns in each edge or side portion of the fabric.

3,662,788

SPRING MAKING MACHINES AND METHODS

Terence J. L. Clarke; Robert C. Quarmby, and Kenneth Dennis, all of Union Works, Belgrave Road, Leicester, England

Filed Apr. 30, 1970, Ser. No. 33,271
Int. Cl. B21f 35/02
U.S. Cl. 140—103 6 Claims



The invention relates to machines and methods for use in forming attaching loops in generally longitudinal orientation at or from end portions of coil springs. A spring is supported by support means of a machine with an end portion to be looped projecting therefrom. The projecting portion is operated upon by means or tools to bend it away from the remainder of the spring as to form a loop and then impart a permanent set to a portion of the wire of the spring whereby to retain the loop in a desired orientation.

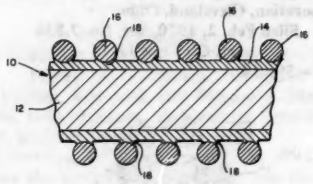
3,662,789

MANDREL FOR MANUFACTURING FILAMENT COILS AND METHOD FOR MANUFACTURING FILAMENT COILS

Ronald C. Koo, Weehawken, and Joel Shurgan, Washington Township, both of N.J., assignors to Duro-Test Corporation, North Bergen, N.J.

Filed Aug. 24, 1970, Ser. No. 66,275
Int. Cl. B21f 45/00
U.S. Cl. 140—71.5 13 Claims

A mandrel and a method for manufacturing filament coils for electric lamps. The mandrel is coated with a material, such as copper, which does not alloy with the filament coil during annealing. The coil is wound on the coated mandrel and the mandrel is dissolved after the filament is annealed.

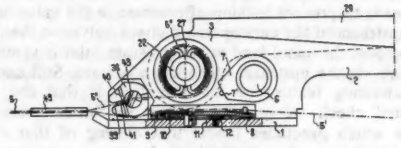


3,662,790

DEVICE FOR STRETCHING CASE RIBBONS OF PLASTIC MATERIAL

Rudolf Styner, Frauenkappelen, Switzerland, assignor to Strapex A. G., Wohlen, Switzerland

Filed Mar. 16, 1970, Ser. No. 19,776
Claims priority, application Switzerland, Mar. 20, 1969, 4201/69
Int. Cl. B21f 9/00
U.S. Cl. 140—123.6 12 Claims



A device for stretching case ribbons of plastic material, having a clamping device for the one ribbon end, a cutting device and stretching mechanism for the other ribbon end and an actuating lever for the stretching mechanism and cutting device, the device being made of simple and cheap molded plastic parts combined with stamped metal parts, and said clamping device having clamping jaws of which the one only is toothed thereby allowing easy operation of the clamping device and careful treatment of the ribbon.

3,662,791

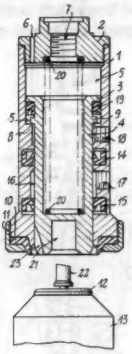
DEVICE FOR EVACUATING THE INTERIOR OF AN AEROSOL MATERIAL CONTAINER ON THE INLET OR MOUTH OF WHICH A BOTTOM PROVIDED WITH DISPENSING

Tomaso Ruscitti, Milan, Italy, assignor to Coster Technologie Speciali S.p.A., Milan, Italy

Filed June 18, 1970, Ser. No. 47,347
Int. Cl. B65b 31/04
U.S. Cl. 141—65 5 Claims

Device for evacuating the interior of an aerosol material container on the inlet or mouth of which a bottom provided with dispensing valve merely bears, the device comprising a rigid body having a recess opening to the outside at an aperture where a resilient sleeve is mounted having a projecting free edge. Within the recess of the rigid body is mounted and movable a piston having a stem between which and the rigid body two gaskets are in sealing relationship and define a chamber connected to a suction pump. The piston is movable between a lowered position where the lower end of the stem

extends adjacent said aperture and the two gaskets are both at sealed conditions, and a raised position where the lower



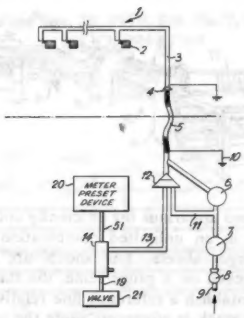
end of the stem is moved away from said aperture and the lower gasket is no longer at a sealed condition.

3,662,792

ANTI-OVERSPILL CONTAINER FILLING APPARATUS

Ian James Grant, Orpington, England, assignor to The British Petroleum Company Limited, London, England

Filed Feb. 6, 1970, Ser. No. 9,183
Claims priority, application Great Britain, Feb. 6, 1969, 6,476/69
Int. Cl. B67d *5/04*
U.S. Cl. 141—198 **13 Claims**



A pneumatically operated overspill prevention system to close a control valve in a liquid supply line if a liquid level sensor mounted in a container being filled responds to a predetermined liquid level. The system includes a pneumatically extensible member mounted in linkage between the valve and a conventional preset meter with the linkage collapsing and the valve automatically returning to a closed position in the event the sensor detects an excessive liquid level. The entire system is pneumatic and is failsafe in that the valve automatically opens in the event of failure of the compressed air supply of the control assembly.

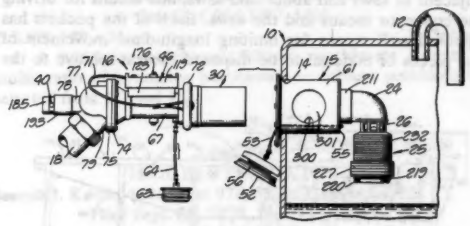
3,662,793

CLOSED SYSTEM LIQUID TRANSFER APPARATUS WITH PRESSURE-SENSITIVE SHUT-OFF

Jay V. Calisher, Montebello, and Ross E. Burbick, Bellflower, both of Calif., assignors to E. B. Wiggins, Inc., Los Angeles, Calif.

Filed Oct. 29, 1969, Ser. No. 872,146
Int. Cl. B65b *1/30, 3/26;* B67d *5/372*
U.S. Cl. 141—198 **5 Claims**

A vented tank has a receptacle fitting at its fill port that mates with a nozzle on the end of a supply hose. Both the receptacle fitting and the nozzle have normally closed valves which open in response to mating of the two parts. The nozzle fitting is equipped with a normally closed snap acting valve which is cocked open during the filling operation and



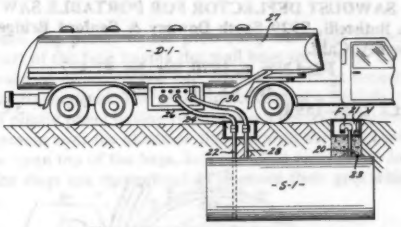
snaps closed in response to abrupt rise in back pressure in the receptacle fitting. The receptacle fitting is equipped with a float valve which closes to cause the abrupt rise in back pressure as the tank fills.

3,662,794

VAPOR CONTROL SYSTEM FOR AN UNDERGROUND STORAGE TANK

Deane S. Turner, 5902 Franmar Circle, Huntington Beach, Calif.

Filed Nov. 23, 1970, Ser. No. 91,719
Int. Cl. B65h *39/04*
U.S. Cl. 141—290 **5 Claims**



A vapor control system for an underground storage tank for gasoline or the like. In this system the underground tank is provided with a vent pipe having its discharge end disposed within an exhaust chamber arranged closely adjacent the ground. This eliminates the conventional comparatively tall vent stack which permits air to escape into the atmosphere as the underground storage tank is filled with gasoline or the like. The vapor control system also includes a vapor discharge pipe that extends from the underground storage tank to the interior of the delivery truck to transfer vapors displaced from the tank into the truck as the tank is filled by the truck.

3,662,795

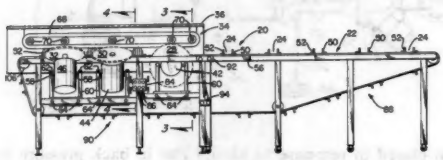
APPARATUS FOR FORMING STAKES, BRIDGING AND THE LIKE

Donald R. Heflin, Fort Collins, Colo., assignor to R. Edward Burton, Fort Collins and Duane C. Burton, Boulder, Colo., part interest to each

Filed Sept. 25, 1969, Ser. No. 860,969
Int. Cl. B27b *5/00;* B27m *3/32*
U.S. Cl. 143—38 **10 Claims**

Apparatus for forming stakes, bridging and the like from new or scrap material particularly from pieces of material of similar but varying cross-sectional dimensions. The apparatus includes a conveyor means having a plurality of laterally disposed pockets longitudinally spaced therealong, three saws one of which is disposed along one side of the conveyor means and the remaining saws being disposed along the other

side of the conveyor means, means for securely holding within each pocket during the sawing operation the pieces of material to be disposed therein to prevent vertical movement thereof relative to the saws, shield means disposed in partial encompassing engagement about said pocket as same pass adjacent to saws and about said saws, and means for driving the conveyor means and the saws. Each of the pockets has opposed wall means for limiting longitudinal movement of the pieces of material to be disposed therein relative to the



conveyor means. Each of the saws is mounted for pivotal movement about a corresponding line disposed parallel to the longitudinal axis of the conveyor means. The driving means includes a separate electric motor for each saw, each saw being mounted upon the shaft of its corresponding motor. A fourth saw may also be mounted along the other side of said conveyor means. An apparatus for forming stakes is obtained by using a guide rail in lieu of a saw along said one side. An apparatus for forming bridging is obtained by using one saw on each side of said conveyor means.

3,662,796

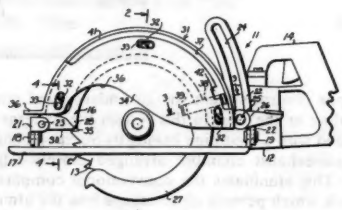
SAWDUST DEFLECTOR FOR PORTABLE SAW

Nello Batistelli, 9929 South Downey & Sanford Bridge Rd., Downey, Calif.

Filed Nov. 6, 1970, Ser. No. 87,412

Int. Cl. B27g *19/00*

U.S. Cl. 143—159 H **3 Claims**



A deflector mountable on the saw blade guard of a portable rotary saw for deflecting sawdust, splinters and other cuttings, comprising a transparent semi-circular channel member adapted to be attached to the saw guard of the saw and effective to deflect the cuttings downwardly without interfering with the operator's view of the saw blade and workpiece at the cutting point.

3,662,797

SCREWDRIVING APPARATUS

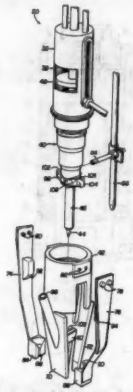
George A. Healis, Fort Lauderdale, Fla., assignor to Behring Corporation, Fort Lauderdale, Fla.

Filed June 18, 1970, Ser. No. 47,412

Int. Cl. B23p *19/06*; **B25b** *21/00*

U.S. Cl. 144—32 **6 Claims**

A rotary screwdriver tool is movable reciprocatively along a linear path to drive a screw temporarily held by screw holders fitting together to retain a screw in the path of the tool. The screw holders are separable as the tool passes between them. Screws are fed successively to the holders by feed means. A cam device further separates the holders during the return stroke of the tool to release any screw which fails to



enter the work. The operation of the apparatus is controlled pneumatically.

3,662,798

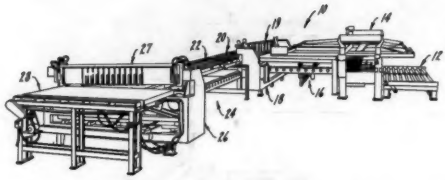
METHOD OF CUTTING PANELS

James W. Campbell, Fort Worth, Tex., assignor to Wetoma Corporation, Ft. Worth, Tex.

Filed Feb. 17, 1969, Ser. No. 805,943

Int. Cl. B27b *5/06*

U.S. Cl. 144—326 **8 Claims**



The method and apparatus for efficiently cutting accurately sized panels in an unlimited combination of sizes and shapes from larger sheets. The sheets are automatically counted and stacked on a gauge table, the stack is clamped by jaws which establish a reference line relative to a cutting station, and the stack is advanced along the table for accurately dimensioned rip cuts. One or more of these cut stacks are then moved on a rip run-out unit to a cut-off infeed and gauge table where they are automatically aligned, clamped to establish a second reference line, and accurately advanced to a cut-off station where cross-cut sawing produces finished panels. The stacks are moved and gauged by either digital or analog hydraulic servo motors which accurately position the reference lines relative to the saw stations by controlled deceleration of the load to stop the stacks. At each saw station holddowns prevent sheet displacement as the saw traverses. Each saw automatically senses cutting load and returns to its initial position immediately upon finishing a cut. Linear saw speed is controlled as a function of saw load. Means are provided to automatically remove trim and scrap.

3,662,799

NUT CRACKING APPARATUS

Paul W. Shaw, 2151 West Road, Whittier, Calif.

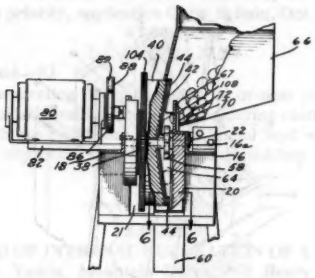
Filed Apr. 20, 1970, Ser. No. 29,821

Int. Cl. A23n *5/04*

U.S. Cl. 146—11 **11 Claims**

Apparatus for cracking nuts, without crushing the kernels thereof, having a fixed plate with a cutting blade and a

rotatable wheel adjacent the plate and having radially arranged cutting blades cooperable with the blade of the plate, the side of the wheel adjacent the plate being in the shape of a shallow frustum, so that the space between the plate and the wheel comprises an operating compartment or chamber.



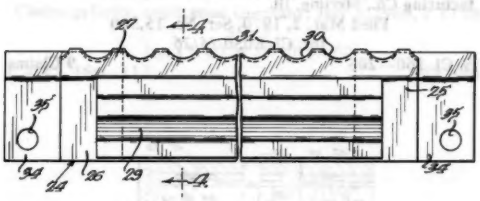
The nuts are fed to the chamber one at a time and, at the bottom of this chamber, the nuts are cracked between the blade of the plate and one of the blades of the wheel. The nuts are cut and twisted by the blades so that the kernels are freed whole and the shells and kernels fall from the operating chamber to a receptacle therefor.

3,662,800

FEED CONVEYOR FLIGHT

Kelly P. Ryan, Blair, Nebr., assignor to Blair Manufacturing Co., Inc.

Filed Jan. 30, 1970, Ser. No. 7,147
Int. Cl. B26d *1/04*
U.S. Cl. 146—129 R **9 Claims**



A flight construction for use in a conveyor for conveying feed from a collection thereof. The flight is arranged to mix the feed by integral self-cleaning means adapted to break up the feed such as by a tearing or cutting operation.

3,662,801

COMPOSITION CAUSING COMBUSTION WHEN CONTACTED WITH WATER

Karl Schneider, Basel, Switzerland, assignor to Scheidemandel-Motard-Werke AG, Berlin-Spandau, Germany

Filed May 15, 1969, Ser. No. 825,059
Claims priority, application Switzerland, May 24, 1968, 7573/68
Int. Cl. C06b *19/02*
U.S. Cl. 149—5 **16 Claims**

A material for causing combustion which includes a carbide capable of reacting with water to form an inflammable gas, an igniter in the form of a metal such as sodium and, optionally, an amide or peroxide of an alkali metal or an alkaline earth metal, and/or other compounds evolving oxygen.

3,662,802

HYDRAZINE PERCHLORATE LITHIUM PERCHLORATE EUTECTICS

Stanley F. Bedell, Andover, Mass., assignor to Monsanto Research Corporation, St. Louis, Mo.

Filed July 2, 1962, Ser. No. 207,460
Int. Cl. C06d *5/00, 5/06*
U.S. Cl. 149—36 **3 Claims**

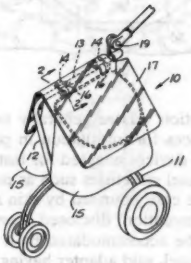
1. A hydrazine perchlorate/lithium perchlorate eutectic, molar ratio of hydrazine perchlorate to lithium perchlorate selected from 1:1 and 1:2.

3,662,803

MAIL BAG PROTECTOR

Joseph J. Kuvik, 4601 West 97th Place, Oak Lawn, Ill.

Filed Sept. 25, 1970, Ser. No. 75,351
Int. Cl. B65d *65/02*
U.S. Cl. 150—52 R **1 Claim**



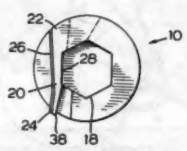
A mail bag protector for protecting mail bags suspended on a cart of the type having the mail bags secured to the cart by means of cleats on the cart over which rings secured to the bag are engaged. The protector consist of a flexible transparent plastic panel having rings secured centrally thereof for engagement over the cleats on the cart with the panel overlying the open top of the bags. In a modified form of the invention the rings are magnetized to improve their grip with the cleats.

3,662,804

SELF-LOCKING FASTENERS

Leo L. Krywitsky, Toronto, and Robert S. Morrow, Weston, Ontario, both of Canada, assignors to said Krywitsky, by said Morrow

Continuation of application Ser. No. 737,685, June 17, 1968, now abandoned. This application Jan. 29, 1970, Ser. No. 6,752
Int. Cl. F16b *39/30, 39/02, 39/00*
U.S. Cl. 151—14 **2 Claims**



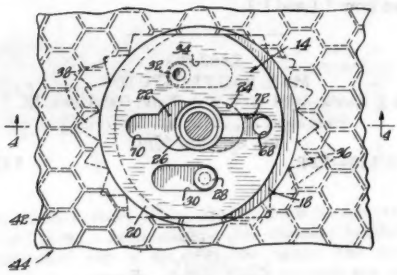
A self-locking screw having an elongated beam extending transversely of the screw at one end of the screw. The beam is formed from the material of the screw and has a length less than the diameter of the screw. A distal end of the beam is adapted to engage the axial wall of a generally cylindrical opening to lock the screw in place. A removal tool is also provided to remove the screw. The tool engages in a tool-engaging well in the screw and deflects the beam radially inwards to disengage the beam from the wall of the opening.

3,662,805

PANEL INSERT DEVICE

Henry A. Sygnator, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 19, 1970, Ser. No. 38,782
Int. Cl. F16b *39/00*
U.S. Cl. 151—41.73 12 Claims



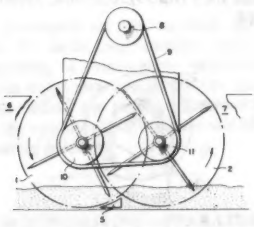
The present invention relates generally to screw accommodating insert devices for installation in panels and more particularly to insert devices adapted for installation in relatively light weight panel structures such as panels comprised of a honeycomb type core bounded by skin sheets. The embodiments of the invention disclosed herein include an adapter member to be accommodated by a complementary cavity formed in a panel, said adapter having a central screw accommodating aperture and hub section, the over all axial extent of the adapter being not substantially greater than the thickness of the panel with which it is to be used. The insert device also includes a pair of superimposed apertured plate members telescopically associated with the hub section and shiftable laterally thereof between concentric and eccentric relation with respect to the hub axis.

3,662,806

AGITATOR FOR BELT CONVEYOR

Kenneth Ridgway, Reading, England, assignor to Fisons Limited, Suffolk, England

Filed June 4, 1970, Ser. No. 43,419
Claims priority, application Great Britain, June 13, 1969, 30,100/69
Int. Cl. B01f *15/00*
U.S. Cl. 259—2 10 Claims



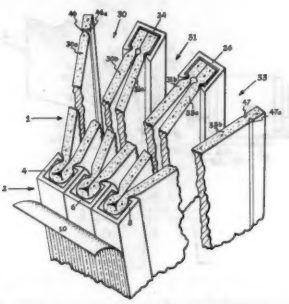
A machine for agitating (or for breaking up agglomerates in) a material, preferably a pharmaceutical composition, on a conveyor, comprising two rotors rotatable in the same sense and having inter-meshing pins, and a 'plough share' co-operating with the rotors to carry material off the conveyor and into the milling zone between the two rotors. A process of milling a material on a conveyor is also provided.

3,662,807

DISPLAY DEVICES

Melvin M. Miller, 3302 Stoney Crest, Bloomington, Ind.

Filed June 29, 1970, Ser. No. 50,586
Int. Cl. A47g *5/00*
U.S. Cl. 160—135 10 Claims



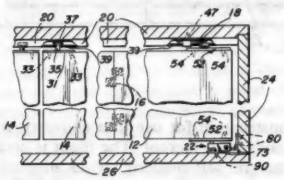
A display device having a composite hinged section which is adapted to receive a plurality of display panels. The hinge section generally consist of a hinge means and a plurality of display panel retaining means. In the preferred embodiment the hinged section is formed from a plurality of U shaped channels the backs and or side of which are connected in such fashion that the individual channels can move in a plane which is parallel with the axis of said channels. The channels can be connected by a plurality of means. It is preferred that a hinge be formed by a sheet material which is attached to the display panel retaining means or that the hinge be an integral part of the display panel retaining means.

3,662,808

BIFOLD DOOR HARDWARE

James A. Edeus, Rock Falls, Ill., assignor to National Manufacturing Co., Sterling, Ill.

Filed Mar. 2, 1970, Ser. No. 15,360
Int. Cl. E05d *15/26*
U.S. Cl. 160—206 9 Claims



Bifold door hardware includes a socket member mounted on an overhead support structure for receiving an upstanding pivot pin on the top edge of the door, and a jamb bracket assembly mounted below the bottom edge of the door for receiving and supporting a depending pivot pin on the bottom edge of the door. The socket member includes a mounting base, a resilient clip extending from one side of the base and having in its distal end a pin-receiving socket hole, and a bumper tab extending from the opposite side of the base. The jamb bracket assembly includes a bracket adapted to be fastened to the support structure, a housing adjustably connected to the bracket for adjusting the horizontal position of the door relative to the support structure, and a helical cam rotatably mounted in the housing below a pivot-pin receiving hole in the top wall thereof for adjusting the vertical position of the door.

3,662,809

METHOD OF PRODUCING METAL CASTINGS BY USING INSULATING PADS IN THE MOLD

John Ernest Gotheridge, Stoneybrook Drive, North Olmsted, Ohio; Jack Morgan, 5059 Douglas Drive, North Olmsted, Ohio, and Edward John Jago, 226 Edgewood Drive, Bera, Ohio

Filed Oct. 3, 1969, Ser. No. 863,700
Claims priority, application Great Britain, Oct. 3, 1968, 47,040/68
Int. Cl. B22d *27/04*
U.S. Cl. 164—53 6 Claims

By incorporating in sand moulds, at or near places where there is risk of insufficient metal feed during casting, pads of bonded fibrous refractory material, metal feed may be substantially improved and the need for padding the casting avoided.

3,662,810

METHOD OF INTERNAL NUCLEATION OF A CASTING

Albert M. Talbot, Mountain Lakes, and Henry W. Soller, Dover, both of N.J., assignors to Howmet Corporation

Filed Sept. 2, 1969, Ser. No. 854,775
Int. Cl. B22d *27/02*
U.S. Cl. 164—57 4 Claims

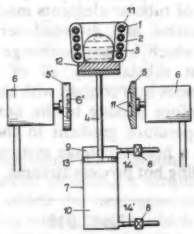
This disclosure relates to methods for nucleating castings to control their grain formation and teaches the addition of a slug of solid material to the superheated melt shortly before pouring for the purpose of forming and maintaining crystalline dendrite fragments in the melt during and after it has been poured into the mold.

3,662,811

METHOD OF CASTING BY CATCHING FREE-FALLING MOLTEN METAL MASS

Paul Esslinger, Frankfurt am Main, and Rudolf Walkling, Frankfurt am Main-Bockenheim, both of Germany, assignors to The Battelle Development Corporation, Columbus, Ohio

Filed June 30, 1969, Ser. No. 837,726
Claims priority, application Germany, July 3, 1968, P 17 58 596.5
Int. Cl. B22d *27/10, 35/00*
U.S. Cl. 164—113 4 Claims



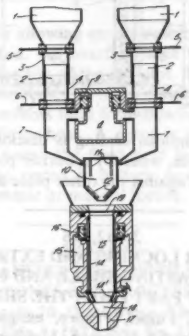
Manufacturing cutting tools from rapidly solidifying alloys in which the molten alloy mass is rapidly transferred between a pair of operating movable mold means which are provided with suitable recesses for forming said molten alloy mass into the desired shape. The pair of mold means are adapted to rapidly cool the molten alloy mass while it is being shaped.

3,662,812

APPARATUS FOR MIXING SAND/RESIN/CATALYST AND BLOWER-FORMING FOUNDRY CORES

Ronald G. Godding, Birmingham, England, assignor to British Cast Iron Research Association, Birmingham, England

Original application May 9, 1967, Ser. No. 637,222, now Patent No. 3,472,307, dated Oct. 14, 1969. Divided and this application Aug. 26, 1969, Ser. No. 870,820
Claims priority, application Great Britain, May 14, 1966, 21,507/66
Int. Cl. B22c *15/24*
U.S. Cl. 164—193 8 Claims



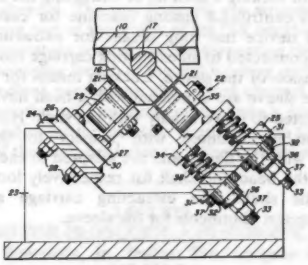
Foundry cores (and possible also molds) are formed using a fast-curing resin by putting the resin in one body of sand and the resin-curing catalyst in another body of sand, blowing these two bodies into a common chamber and then immediately transferring the resulting mixture, for example by blowing, to the core-forming or mold-forming cavity.

3,662,813

GUIDE MECHANISM FOR OSCILLATING CONTINUOUS CASTING MOLD

James T. Stull, Jackson Township, Butler County, Pa., assignor to United States Steel Corporation

Filed Aug. 6, 1970, Ser. No. 61,568
Int. Cl. B22d *11/00*
U.S. Cl. 164—273 5 Claims



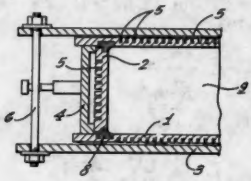
A conventional continuous-casting mold oscillates vertically. Invention is an improved guide mechanism for maintaining the mold in alignment with parts beneath and holding the mold firmly as it oscillates. The frame which carries the mold has vertically extending guide rails of hollow V-shape in cross section on opposite sides. Rails are engaged by rollers, one of which is spring mounted. Hold-down rods for the oscillating mold frame extend lengthwise through the rails.

3,662,814

MOLD FOR CONTINUOUS CASTING OF METAL

Adolf Kipp, Osnerbruck, Germany; Walter Stockinger, Torshalla, Sweden, and Peter J. Konig, Zumikon, Switzerland, assignors to Concast AG, Zurich, Switzerland, a part interest

Filed Aug. 28, 1969, Ser. No. 853,698
Claims priority, application Germany, Aug. 24, 1968, P 17 58 867.9
Int. Cl. B22d 11/02
U.S. Cl. 164—283 15 Claims



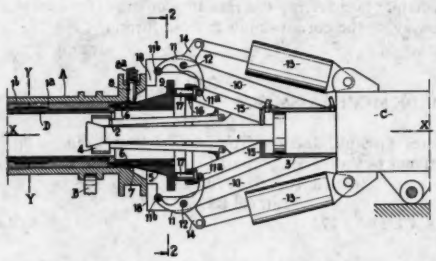
A mold for continuous casting is disclosed having plates joint at corner pieces, whereby a corner piece is bolted to a plate and tensioned against the other plate at that corner.

3,662,815

DEVICE FOR LOCKING AND EXTRACTING A CENTRIFUGAL CASTING SHELL AND REMOVING THE CAST PART FROM THE SHELL

Jean Roger Bouyt, Fumel, France, assignor to Centre De Recherches De Pont-A-Mousson, Maidieres, Pont-A-Mousson, France

Filed Feb. 1, 1971, Ser. No. 111,223
Claims priority, application France, Feb. 4, 1970, 7003938
Int. Cl. B22d 13/10
U.S. Cl. 164—292 5 Claims



Device for locking a shell in, or extracting the shell from, a sleeve of a centrifugal casting machine for casting tubular parts. The device has tong means for extracting the part which are connected to an extracting carriage movable in the axial extension of the sleeve. Locking means for locking the shell in the sleeve are combined with a head having a flange and connected to move axially with the shell. Hooking members pivotably mounted with respect to the carriage cooperate with the flange and are adapted to exert a push or a pull on the head and shell for respectively locking or unlocking the shell. The extracting carriage also carries counter-support abutments for the sleeve.

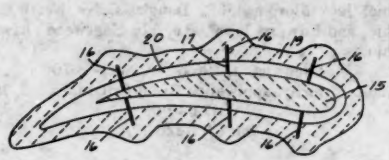
3,662,816

MEANS FOR PREVENTING CORE SHIFT IN CASTING ARTICLES

Thomas H. Bishop, Alliance, and Kenneth K. Young, Jr., Paris, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Original application Oct. 1, 1968, Ser. No. 764,208, now Patent No. 3,596,703. Divided and this application Apr. 30, 1970, Ser. No. 43,624
Int. Cl. B22c 9/10, 21/14
U.S. Cl. 164—366 1 Claim

Shell-type casting molds for producing hollow cast articles, the mold being built up by forming a low melting pattern about a ceramic core, inserting thin metal pins through the pattern and into engagement with the core, forming a shell mold about the resulting pattern so that the ends of the pins



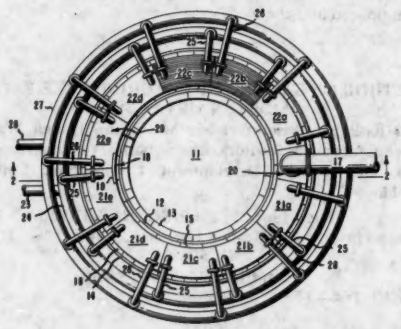
are anchored in the resulting shell mold, removing the meltable pattern, and casting the molten metal into the cavity thus produced whereby the molten metal dissolves the pins and no holes appear in the finished article.

3,662,817

PROCESS FOR ACCOMPLISHING HEAT EXCHANGE BETWEEN A CORROSIVE LIQUID PROCESS STREAM AND A SECOND LIQUID

Earl L. Kendrick, and Harry W. Sandberg, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 26, 1970, Ser. No. 40,584
Int. Cl. F28c 7/06
U.S. Cl. 165—1 9 Claims



The use of a plurality of heat exchange bundles, each comprising a plurality of tubular elements made from an organic polymeric composition and disposed serially in a narrow channel through which a heat exchange liquid flows in a manner such that substantially all of the flowing heat exchange liquid comes into contact with the tubular elements of each bundle before passing to the next bundle, thereby developing a temperature gradient in the fluid within the channel, provides a heat exchange system which is particularly useful in cooling hot process streams.

3,662,818

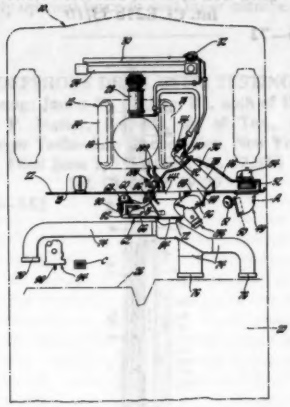
VAPOR TRANSFER

John Snyder, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed May 11, 1970, Ser. No. 36,078
Int. Cl. B60h 3/04
U.S. Cl. 165—23 5 Claims

In preferred form, an automobile heating and air conditioning system having a plenum chamber containing a heater core and an evaporator core, and a closable purge outlet opening into the passenger compartment. When the heating and air conditioning system is inoperative, the purge outlet allows air to flow through the plenum chamber and into the passenger compartment to prevent the formation of odor and humidity in the chamber. When the system is operative to

heat, cool or ventilate the automobile interior, the purge outlet is blocked by a pivotal door which also directs air through



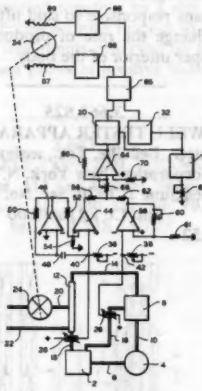
a heater outlet for distribution into the passenger compartment.

3,662,819

FLUID TEMPERATURE CONTROLLER

Rolland L. Hartline, Jr., Buchanan, Mich., assignor to Clark Equipment Company

Filed Oct. 9, 1970, Ser. No. 79,417
Int. Cl. F25b *29/00*
U.S. Cl. 165—26 10 Claims



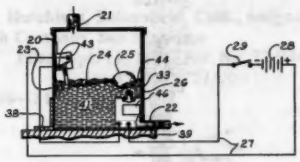
Apparatus for controlling the operating fluid temperature in a closed fluid circuit including a torque converter and a heat exchanger in which the heat generated in the torque converter fluid varies widely and in which part of the fluid bypasses the heat exchanger. An electrical signal is generated whose amplitude is dependent on the temperature of the fluid leaving the heat exchanger which signal is modified to reflect the rate of change of this temperature. A second signal is generated, the amplitude of which is dependent on the temperature of the fluid bypassing the heat exchanger and this signal is modified to reflect the percentage of the fluid bypassing the heat exchanger. These signals are combined and the resulting signal is compared at preselected intervals to a standard signal representing the desired fluid temperature to control the coolant flow through the heat exchanger.

3,662,820

RADIATOR OVERFLOW APPARATUS

Bob N. Myer, 4834 Wanamaker Drive, Indianapolis, Ind.

Filed Feb. 18, 1970, Ser. No. 12,270
Int. Cl. F01p *11/02*
U.S. Cl. 165—51 2 Claims



An apparatus for allowing excess radiator fluid to overflow without loss of fluid. An overflow tank is connected to an overflow tube in the top of the radiator. The exit tube of the overflow tank is connected to the radiator hose and a valve is provided which prevents fluid from flowing into the overflow tank from the radiator hose. A pump is provided within the overflow tank to pump the fluid held by the tank into the radiator hose. The pump is battery powered and may be energized by automatic or manual means.

3,662,821

HEAT TRANSFER ROLL WITH SEPARATE TEMPERATURE ZONES FOR PROCESSING MATERIALS

Daniel I. Saxon, Route 10, Otari Drive, Kingsport, Tenn.

Filed Feb. 1, 1971, Ser. No. 111,346
Int. Cl. F28f *5/02*
U.S. Cl. 165—89 3 Claims

Heat transfer roll for processing materials and having separate temperature zones along its outer surface. The roll has an outer shell and an inner shell with a series of serpentine channels formed between the two shells along a predetermined length of the roll, and with a helical channel formed between the two shells around the roll along the remaining length of the roll. A heat transfer medium circulates through the serpentine channels and is of a different temperature than the heat transfer medium that flows along the helical channel. The two channels are arranged so as to establish along part of the length of the roll working surface a uniform temperature zone above the serpentine channels and along the remaining length of the roll working surface a temperature gradient zone above the helical channel. The temperature from the uniform temperature zone is conducted in part to the adjacent temperature gradient zone to minimize possibility of thermal shock due to differential expansion.

3,662,822

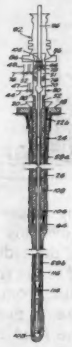
METHOD FOR PRODUCING A BENTHONIC WELL

Charles E. Wakefield, Jr., Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Continuation of application Ser. No. 595,790, Nov. 21, 1966, which is a continuation-in-part of application Ser. No. 498,851, Oct. 20, 1965, now Patent No. 3,332,481, dated July 25, 1967. This application May 12, 1969, Ser. No. 823,734
Int. Cl. E21b *33/035*
U.S. Cl. 166—.5 4 Claims

This invention relates to a method for production of oil and gas from an underwater formation with a remotely con-

trollable production head positioned proximate the ocean floor. According to the method described, an apertured landing base is installed at the formation and a well casing attached to the lower end of the production head is lowered through the base into the well and landed on the base.



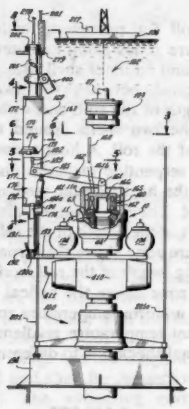
Production tubing is then secured to a tubing hanger mandrel and lowered through the well and production head and landed in the production head. The production head is then plugged and the well produced through side outlets in the production head without connection to the structure at the ocean surface.

3,662,823

REPLACEMENT OF SUB-SEA BLOW-OUT PREVENTER PACKING UNITS

Fernando Murman, Palos Verdes Peninsula; George E. Lewis, Arcadia; Allen I. Dunn, Los Angeles, and Charles E. O'Brien, Whittier, all of Calif., assignors to Hydril Company, Los Angeles, Calif.

Filed July 31, 1970, Ser. No. 60,066
Int. Cl. E21b *33/035*
U.S. Cl. 166—.6 **6 Claims**



A method of retrieving a blow-out preventer packer from a blow-out preventer body at a sub-sea well head location includes the steps:

a. elevating, relative to the body, a packer holddown means to vertically expose the packer for removal, in the sea,

b. moving a packer retrieval tool laterally and downwardly to penetrate the body, and effecting lifting attachment of the tool to the packer, and

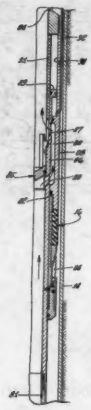
c. moving said tool with the packer attached thereto upwardly and laterally in the sea to lift the packer out of vertical alignment with the body, for subsequent elevation of the packer to the surface.

3,662,824

SELF-CLOSING, SUB-SURFACE WELL SAFETY VALVE

John S. Page, Jr., 2842 Fifth Street, Boulder, Colo.

Filed Oct. 5, 1970, Ser. No. 77,811
Int. Cl. E21b *33/10*
U.S. Cl. 166—72 **14 Claims**



Sub-surface well flow control apparatus comprises:

a. a tubular body,

b. production tubing extending into the well below said body,

c. a source of control fluid pressure,

d. actuator means cooperating with the body and responsive to sufficient increase of control fluid pressure application to elevate the tubing within a limited range, and to sufficient reduction of said fluid pressure application to effect lowering of the tubing, and

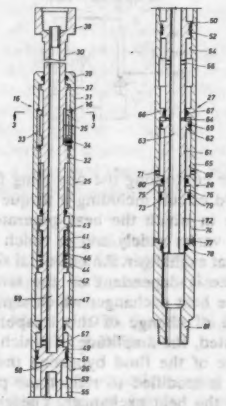
e. valving means responsive to said lifting and lowering of the tubing to change the rate of production flow from the tubing to the upper interior of the body.

3,662,825

WELL TESTER APPARATUS

Benjamin P. Nutter, Bellville, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed June 1, 1970, Ser. No. 42,373
Int. Cl. E21b *49/00*
U.S. Cl. 166—152 **9 Claims**



A drill stem tester assembly is disclosed including an inner member movable upwardly and downwardly within an outer member, valve means for opening and closing a test passage through said members in spaced longitudinal positions, a

balance piston on said inner member having its upper and lower faces subjected respectively to the pressure of fluids within the inner member and in the well annulus, and a bias piston responsive to the hydrostatic head of fluids in the annulus to apply upward force to said inner member.

3,662,826

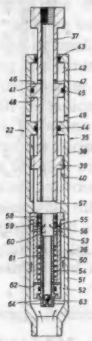
OFFSHORE DRILL STEM TESTING

David E. Young; James W. Kisling, III, both of Houston, and Benjamin P. Nutter, Bellville, all of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed June 1, 1970, Ser. No. 42,374

Int. Cl. E21b *49/00*

U.S. Cl. 166—152 **11 Claims**



Apparatus for offshore drill stem testing from a floating vessel using a tester operated by upward and downward motion and coupled to a packer by a slip joint, the equipment being suspended in the well bore on upper and lower pipe string sections connected together by a slip joint. The tester and slip joints are balanced with respect to fluid pressure so that a sequence of free points observed on the rig weight indicator at the surface provides positive indications of operation of the tools.

3,662,827

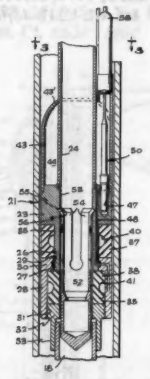
WELL CONTROL MEANS

August L. Segelhorst, 211 Las Alturas, Santa Barbara, Calif.

Filed Aug. 25, 1970, Ser. No. 70,625

Int. Cl. E21b *33/127*

U.S. Cl. 166—187 **13 Claims**



A control device for mounting in a well tubing and serving in place of a short section thereof, embodying normally retracted, expansible seal means to close the annular space around the device inside the well casing and to close the passage through the device, together with its own supply of pressure fluid for expanding the seal means, and remote control means to operate and test the seal means.

3,662,828

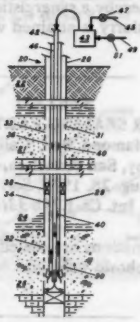
THROUGH TUBING WELL CLEANOUT METHOD USING FOAM

Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco

Filed Sept. 11, 1970, Ser. No. 72,934

Int. Cl. E21b *21/00*

U.S. Cl. 166—312 **3 Claims**



A method of cleaning out a well having a production tubing located therein without removing the production tube from the well by providing a flushing tube inside the production tube, generating pre-formed foam having a liquid volume to gas volume ratio in the range of from 0.05 to 0.1, injecting said foam into the flushing tube and down the well at a pressure within the range of from 350 to 1,000 or more psi and circulating the foam up the annulus between the production tube and the flushing tube while maintaining the annular velocity of the foam within the range of from 600 to 1,000 feet per minute.

3,662,829

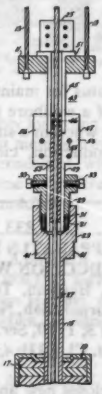
POLISHED ROD LINER EXTENSION

Robert H. Gault, Midland, Tex., and Robert F. Joy, Bethlehem, Pa., assignors to Bethlehem Steel Corporation

Filed July 2, 1970, Ser. No. 51,874

Int. Cl. E21b *33/04*

U.S. Cl. 166—84 **14 Claims**



A tubular extension is secured to the upper portion of a polish rod liner and suspends it from a carrier bar. Improved sealing is provided by a resilient lining within a portion of the extension.

3,662,830

AQUEOUS HYDRAULIC CEMENT COMPOSITION HAVING IMPROVED RETARDATION TO SET AND USE THEREOF IN HIGH TEMPERATURE ENVIRONMENTS

Robert C. Martin, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 1, 1970, Ser. No. 42,569
Int. Cl. E21b *33/13*; C04b *13/28*
U.S. Cl. 166—293 5 Claims

In a method of cementing at relatively high ambient temperatures employing an aqueous hydraulic cement slurry, the improvement comprising admixing therewith an effective amount of both (1) a salt of lignosulfonic acid and (2) boric acid or a borate whereby a synergistic retarding effect on the setting rate of the slurry is attained without any accompanying adverse effects.

3,662,831

METHOD FOR SEALING EARTH FORMATIONS

Patrick H. Hess, Diamond Bar, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 28, 1970, Ser. No. 68,032
Int. Cl. E21b *33/138*
U.S. Cl. 166—295 11 Claims

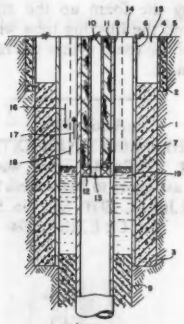
Porous earth formations are sealed by alternately injecting concentrated phosphoric acid and furfuryl alcohol into the formations.

3,662,832

INSULATING A WELLBORE IN PERMAFROST

William A. Keeler, and Frank J. Schuh, both of Dallas, Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,223
Int. Cl. E21b *43/24*
U.S. Cl. 166—302 9 Claims



A method and apparatus for maintaining at least a portion of the interior region of a wellbore thermally insulated from the wall of the wellbore wherein a single zone in the wellbore is utilized for the introduction, circulation, and return of cooling fluid.

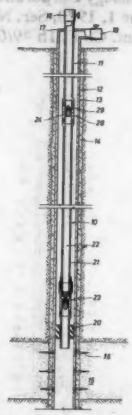
3,662,833

METHODS AND APPARATUS FOR COMPLETING PRODUCTION WELLS

James W. Kisling, III, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed June 3, 1970, Ser. No. 43,066
Int. Cl. E21b *43/00*
U.S. Cl. 166—314 20 Claims

This application discloses new and improved methods and apparatus for completing production wells having perforations which either are to be cleaned or penetrate earth formations which are to be fractured, acidized, or treated such as, for example, to inhibit the subsequent production of unconsolidated formation materials. To practice the present invention, a new and improved production tool is arranged for coupling into a string of production tubing and includes a typical well packer coupled to an elongated tubular member defining an enclosed chamber of a substantial volume and which is initially maintained at a reduced pressure by a selectively-releasable tubing plug and a new and improved normally-closed valve respectively arranged at the upper and lower ends of the tubular member. The production string and the tool are installed in a cased well bore with the packer being set above a previously-perforated interval traversing an



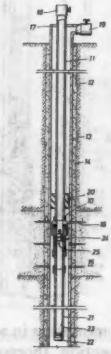
earth formation which is to be subsequently produced. Once the customary wellhead equipment is installed, the normally-closed valve is selectively opened by rotating the production string from the surface. Upon opening of this valve, formation fluids will be suddenly exhausted into the reduced-pressure chamber for removing contaminants that may have previously entered the formation following the perforation of the casing so as to leave only uncontaminated formation materials immediately surrounding the perforations. Thereafter, the tubing plug is removed to permit selected fluids to be pumped by way of the production string through the perforations and into the adjacent earth formations.

3,662,834

METHODS AND APPARATUS FOR COMPLETING PRODUCTION WELLS

David E. Young, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed June 3, 1970, Ser. No. 43,067
Int. Cl. E21b *43/00*
U.S. Cl. 166—314 20 Claims



This application discloses new and improved methods and apparatus for completing production wells having perfora-

tions which either are to be cleaned or penetrate earth formations which are to be fractured, acidized, or treated such as, for example, to inhibit the subsequent production of unconsolidated formation materials. To practice the present invention, a new and improved production tool is arranged for coupling into a string of production tubing and includes a typical well packer having an elongated tubular member dependently coupled therebelow and capped at its lower end for defining an enclosed chamber of a substantial volume below the packer which is initially maintained at a reduced pressure by a new and improved normally-closed pressure-actuated valve arranged at the upper end of the tubular member. The production string and the tool are installed in a cased well bore with the packer being set above a previously-perforated interval traversing an earth formation which is to be subsequently produced. Once the customary wellhead equipment is installed to provide communication from the surface with the tubing, the normally-closed valve is selectively opened by increasing the pressure of the fluids in the production string above the packer. Upon opening of this valve, formation fluids will be suddenly exhausted into the reduced-pressure chamber for removing contaminants that may have previously entered the formation following the perforation of the casing so as to leave only uncontaminated formation materials immediately surrounding the perforations. Thereafter, a selectively-releasable tubing plug in the production tool above the normally-closed valve is removed to permit selected fluids to be pumped by way of the production string through the perforations and into the adjacent earth formations.

3,662,835

PHASE CHANGE METHOD

William L. Livingston, Norwood, Mass., assignor to Factory Mutual Research Corporation, Turnpike, Mass.

Filed Apr. 14, 1970, Ser. No. 28,509
Int. Cl. A62c *3/00*
U.S. Cl. 169—1 R **7 Claims**

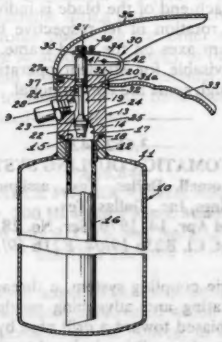
Imparting a phase change to liquids normally characterized by properties of Newtonian flow and internal convection by converting said liquids to a gel characterized by plastic flow and no internal convection, and exposing said gel directly or indirectly to a heat exchange medium. This method provides essentially instant initial response, minimizes convection losses, and provides phase change without total system involvement.

3,662,836

FIRE EXTINGUISHER

Timo Siimes, 1680 Kildare Road, Windsor, Ontario, Canada

Filed July 28, 1969, Ser. No. 845,226
Int. Cl. A62c *13/00*
U.S. Cl. 169—31 R **8 Claims**



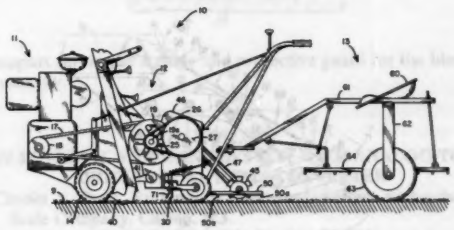
A fire extinguisher comprises a container filled with fire extinguishing material under pressure and a valve assembly on the container. The valve assembly comprises a valve body having an axial opening and a plunger which is yieldingly urged outwardly to close the opening and prevent the fire extinguishing material from being dispensed. A lever is provided for moving the plunger and thereby dispensing the material.

3,662,837

SOD SEVERING AND ROLL FORMING APPARATUS

Raymond C. Rothi, St. Paul, Minn., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 10, 1969, Ser. No. 797,972
Int. Cl. A01b *45/04*
U.S. Cl. 172—20 **10 Claims**



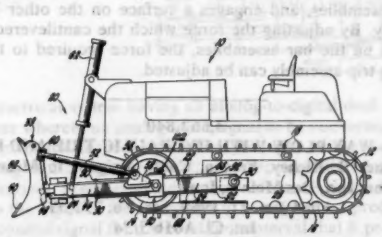
A sod severing and rolling apparatus having a reciprocating knife for severing the sod at predetermined intervals and a set of prongs for lifting the end of the severed sod vertically upward and a rack for forming the start of a sod roll.

3,662,838

ANGLE DOZER ASSEMBLY

Dwaine N. Polzin, Hudson, and Leslie J. Lesko, Novelty, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed July 15, 1970, Ser. No. 54,903
Int. Cl. E02f *3/76*
U.S. Cl. 172—804 **4 Claims**



An angle dozer assembly including a C-frame supported by a tractor. A pair of thrust members extend rearwardly from a moldboard and each terminates with a carriage which is slidable along the C-frame to different locked positions for purposes of angling the moldboard.

3,662,839

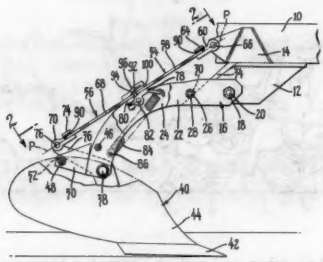
EARTHWORKING IMPLEMENT

Ole J. Thorsrud, Dearborn Heights, and Howard G. Thompson, Livonia, both of Mich., assignors to Massey Ferguson Inc., Detroit, Mich.

Filed May 21, 1970, Ser. No. 39,195
Int. Cl. A01b *61/04, 35/20*
U.S. Cl. 172—266 **9 Claims**

An improved earthworking implement which includes a frame, a standard pivotally attached to the frame, an earthworking tool and a shank pivotally attached to the lower portion of the standard, stops to limit pivotal movement of

the standard and the earthworking tool, and a spring trip device to position the standard in a lower working position, to absorb energy and to release and allow the earthworking tool to move up and to the rear when the earthworking tool strikes an obstruction. The spring trip device includes a first bar assembly with a leaf spring pivotally attached to the frame for pivotal movement about a first axis, a second bar assembly with a leaf spring pivotally attached to the shank for pivotal movement about a second axis which is in the same plane as the first axis, and a pin means to pivotally attach the first bar assembly to the second bar assembly for pivotal movement relative to the second bar assembly about an axis which is parallel to and spaced to one side of the plane containing the first axis and the second axis when the standard is in the working position. Stops are provided to



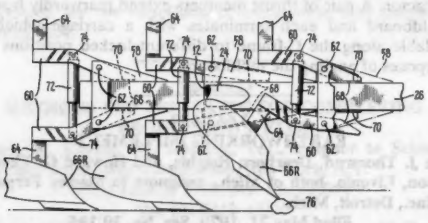
limit movement of the pin means, for attaching the first bar assembly to the second bar assembly, away from the plane containing the first and second axis when the standard is in the working position. An abutment surface on the first bar assembly contacts an abutment surface on the second bar assembly, after the trip assembly has been loaded and the leaf springs have been deformed a certain amount, to limit pivotal movement of one bar assembly relative to the other bar assembly. A relative small increase of the force on the earthworking tool after the abutment surfaces make contact causes bar assemblies to move rapidly away from stops. A resilient cantilevered beam is rigidly attached to one of the bar assemblies, and engages a surface on the other bar assembly. By adjusting the force which the cantilevered beam exerts on the bar assemblies, the force required to trip the spring trip assembly can be adjusted.

3,662,840

TWO-WAY PLOW WITH HYDRAULIC TRIP AND RESET

Clarence B. Richey, Fresno, Calif., assignor to Massey-Ferguson, Inc., Des Moines, Iowa

Filed Jan. 21, 1969, Ser. No. 792,391
Int. Cl. A01b *3/34*
U.S. Cl. 172—224 **7 Claims**



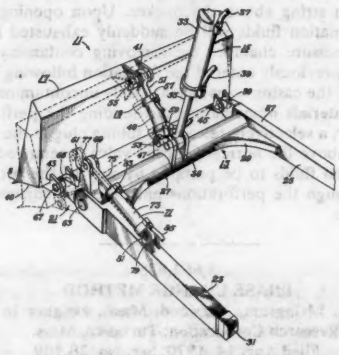
A two-way semi-mounted plow comprises a pull tube having a rear steerable tail wheel and which journals a diagonal beam mounting two rows of opposed left and right-hand plow bottoms. Power means is provided for rotating the beam 180° to alternately engage each row of bottoms with the ground. Each bottom is mounted on the end of a support arm which is pivoted to the beam. A hydraulic ram interconnects each pair of opposed support arms to extend the bottoms until the other ends of the support arms abut the beam. Upon encountering an obstacle, a bottom will deflect, compressing the ram which reacts through the opposed support arm on the frame. Thus only one ram is required for each pair of opposed bottoms.

3,662,841

MOUNTING OF DOZER BLADES

Lloyd A. Molby; Lloyd L. Magown, and Larry T. Steiner, all of Longview, Tex., assignors to R. G. Le Torneau, Inc., Longview, Tex.

Filed Feb. 2, 1970, Ser. No. 7,830
Int. Cl. E02f *3/76*
U.S. Cl. 172—804 **5 Claims**



This specification discloses a method and a mounting assembly for attaching a dozer blade to a tractor characterized by enabling the blade to be set to a desired degree of pitch and tilt without inducing twist into or causing other undesirable concentrations of stresses in the mounting assembly and by enabling side booms of the mounting assembly to be fit closely to the tractor on which the blade is mounted. The mounting assembly has a rigid frame for attaching to the tractor; an independent pitching means connecting the top center of the blade with the rigid frame for effecting pitch of the blade; and independent tilting means including at at least one end of the blade a bell crank connected therewith for moving that end of the blade up and down with respect to the rigid frame in response to torque from a means inter-connected between the other end of the bell crank and the rigid frame and operable to rotate the bell crank about a fulcrum axis on the rigid frame. Also disclosed is a preferred embodiment in which each end of the blade is individually movable up or down by rotation of its respective bell crank about respective fulcrum axes on the rigid frame. Other elements necessary or advisable for efficient operation are also disclosed, even though some are conventional.

3,662,842

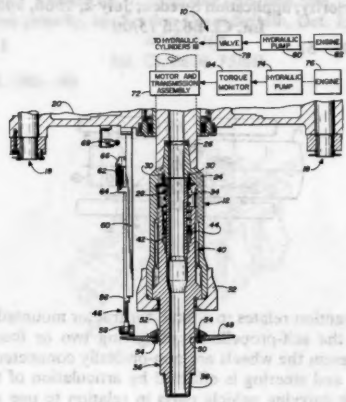
AUTOMATIC COUPLING SYSTEM

Raymond J. Bromell, Dallas, Tex., assignor to Automatic Drilling Machines, Inc., Dallas, Tex.

Filed Apr. 14, 1970, Ser. No. 28,344
Int. Cl. B23p *19/04;* **E21b** *19/16*
U.S. Cl. 173—1 **18 Claims**

In an automatic coupling system, a threaded quill is connected to a rotating and advancing mechanism by a slip coupling and is biased toward a drill pipe by a spring. In the use of the system, the quill is advanced toward the drill pipe and is simultaneously rotated with respect to the pipe. When the quill engages the pipe, it slips relative to the advancing

and rotating mechanism against the action of the spring until a quill advance terminating switch is closed. The rotation of



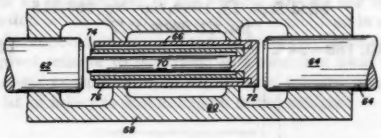
the quill is continued until the torque on the quill reaches a predetermined limit.

3,662,843

IMPACT TOOLS

Boyd A. Wise, Webster, N.Y., assignor to General Dynamics Corporation

Filed Jan. 29, 1970, Ser. No. 6,820
Int. Cl. B25d 9/04
U.S. Cl. 173—131 18 Claims



Impact tools are described which have an anvil system for transmitting force pulses generated by the hammer to a load. The anvil system includes an impact spring arrangement, the spring being either mechanical or liquid. In one embodiment the spring has a variable spring rate which changes under the duration of the force pulses. In the other embodiment the spring is operative to absorb the energy in the trailing end of the force pulse and return it to the hammer. In this manner, force pulses are transmitted which have a shape which may be efficiently utilized by the load.

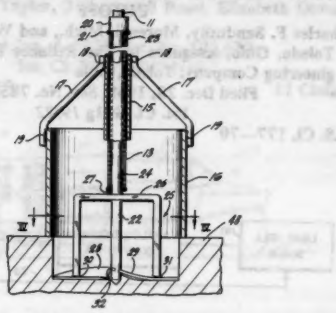
3,662,844

DETACHABLE POWER AUGER ASSEMBLY

Edward C. Baker, 200 Hawthorn Road, Marshall, Mich.

Filed July 6, 1970, Ser. No. 52,539
Int. Cl. F25c 5/04
U.S. Cl. 175—18 5 Claims

A portable power auger attachment designed for boring holes in ice for fishermen is provided which is adapted to be connected to a portable power source, as for example the gasoline engine of a snowmobile. The auger comprises a flexible shaft, means for coupling one end of the shaft to the power source, and an auger blade assembly connected to the other end of the shaft including an auger blade mounted in a tubular support and having a housing axially slidable on said



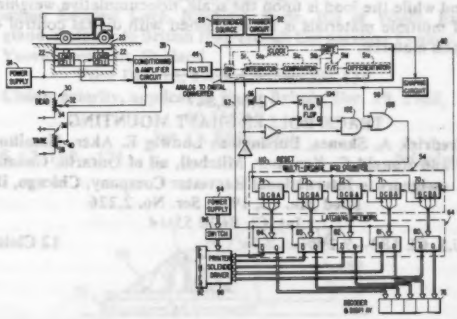
support serving as a guide and protective guard for the blade assembly.

3,662,845

ELECTRICAL WEIGHING SYSTEM WITH ANALOG-TO-DIGITAL DUAL RAMP CONVERTER

Chapin A. Pratt, Rutland, Vt., assignor to Howe Richardson Scale Company, Clifton, N.J.

Filed July 27, 1970, Ser. No. 58,260
Int. Cl. G01g 3/14
U.S. Cl. 177—25 4 Claims



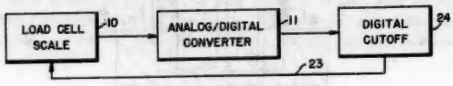
An electrical system having an analog-to-digital dual ramp converter wherein an analog input signal to be converted into recurrent digital form is applied to the input of the converter's integrator circuit for a first, predetermined time interval and a known, predetermined analog reference signal is applied to the input of the integrator in response to a predetermined control signal for a second time interval that is proportional to the magnitude of the analog input signal. A series of sequentially occurring pulses of fixed time separation are produced by a pulse generator and are transmitted by a gate to a pulse counter. The gate, which is under the control of the integrator output, will be open for the two time intervals during which the integrator output deviates from a predetermined level in a predetermined direction. At the beginning of the first time interval the counter is reset to a predetermined starting count, and it will be driven by the gated generator-produced pulses to a predetermined intermediate scale count which is less than the full scale count. At this time, the previously mentioned control signal is supplied from the counter for applying the reference signal to the integrator. The control signal is also gated by a logic circuit to reset the counter. The logic circuit is conditioned by the reset signal and the occurrence of the control signal at the end of the first time interval to inhibit any re-occurrence of the control signal during the second time interval in which the counter is being driven by the generator-produced pulses to supply a digital output representing the magnitude of the analog input signal.

3,662,846

BATCH WEIGHING WITH NON-CUMULATIVE DIGITAL CUTOFF

Charles F. Sandusky, Morenci, Mich., and William C. Susor, Toledo, Ohio, assignors to The Reliance Electric and Engineering Company, Toledo, Ohio

Filed Dec. 23, 1968, Ser. No. 785,992
Int. Cl. G01g 19/22
U.S. Cl. 177—70 4 Claims



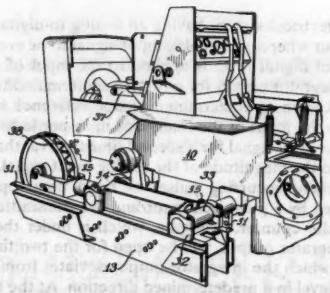
A digital cutoff system comprising a weighing scale for producing analog signals in accordance with the desired weights of a plurality of materials successively placed upon the scale, analog-to-digital converter means for changing the analog signals to digital signals, means operable while one or more of the materials are upon the scale for resetting the converter means to cancel the digital signals corresponding to said one or more materials, and circuit means for producing a cutoff signal in response to digital signals corresponding to the desired weight of each of said plurality of materials. By resetting the converter means after each material is weighed and while the load is upon the scale, noncumulative weighing of multiple materials is accomplished with digital control of each material.

3,662,847

TRACK ROLLER SHAFT MOUNTING

Fredrick A. Skanes, Burlington; Ludwig E. Aker, Hamilton, and Ronald G. Kraemer, Mitchell, all of Ontario, Canada, assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 12, 1970, Ser. No. 2,226
Int. Cl. B62d 55/14
U.S. Cl. 180—9.2 R 12 Claims



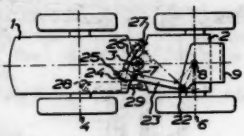
Seal bracket and spacer construction for mounting track rollers of a crawler tractor. Brackets are provided which not only carry seals between track rollers and their shafts as well as mount the shafts on side members, but also aid in maintaining the side members in spaced relation to one another. To this end, upwardly projecting extensions on the brackets and a longitudinal plate are provided. The longitudinal plate is the back up member against the top ends of the bracket extensions and is welded at intervals to the side members, to which members the brackets are secured, and which members are secured to the tractor body by gage bars.

3,662,848

HITCHES FOR TRACTOR-MOUNTED IMPLEMENTS

Elof Folke Magnusson, Sydvarnsgaton 5 B, 653 44 Karlstad, Sweden

Filed July 2, 1969, Ser. No. 838,478
Claims priority, application Sweden, July 2, 1968, 9084/68
Int. Cl. B62d 15/00
U.S. Cl. 180—51 1 Claim



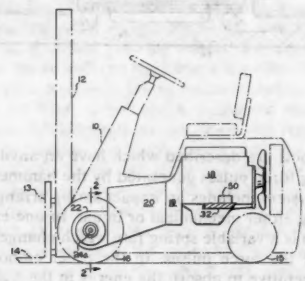
This invention relates to a hitch for tractor mounted implements of the self-propelled type having two or four-wheel drives wherein the wheels are non-pivotally connected to the two axles and steering is effected by articulation of the two wheel axle carrying vehicle parts in relation to one another by means of a steering mechanism provided between the vehicle parts. The hitch is mounted for pivotal movement on a vertical shaft carried on one of the vehicle axle carrying wheel parts such that the hitch is pivotally connected to one of the aforesaid vehicle parts. The hitch is coupled to the steering mechanism by means of a transmission which is adapted to swing the hitch approximately equally in opposite directions in relation to the aforesaid vehicle parts.

3,662,849

MOUNTING ARRANGEMENT FOR VEHICLE DRIVE TRAIN

Wayne W. Bostad, and Ralph F. Golik, both of Portland, Oreg., assignors to Hyster Company, Portland, Oreg.

Filed Sept. 23, 1969, Ser. No. 860,215
Int. Cl. B60k 5/12
U.S. Cl. 180—54 E 14 Claims



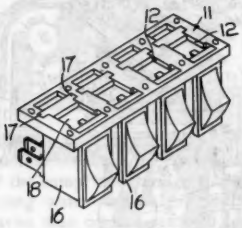
A lift truck has a short coupled unitized drive train including engine, transmission, differential gearing, axle shafts and drive wheels drivingly interconnected without universal joints. Split axle housings are connected rigidly to the truck frame and rotatably support the axle shafts and drive wheels. Rubber isolators support the engine block on the frame. A differential housing has sleeve portions which extend between the axle shaft and axle housing. Elastomer bushings separate the differential sleeves from the axle housings but resiliently support the differential housing on such axle housings, thereby isolating the differential housing and rigidly connected transmission housing and engine block from wheel loads and brake torque transmitted from the drive wheels to the axle housing and frame.

3,662,850

MOUNTING MEANS FOR SWITCHES INSTRUMENTS OR THE LIKE

David Foley, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Oct. 7, 1969, Ser. No. 864,504
Claims priority, application Great Britain, Oct. 15, 1968, 48,842/68
Int. Cl. B60k *35/00*
U.S. Cl. 180—90 2 Claims



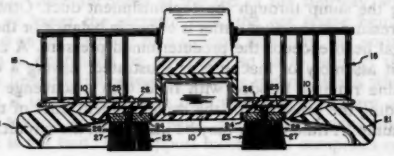
Mounting means for instruments, switches or the like in road vehicles. The mounting means includes a mounting frame which can be attached to a panel of a road vehicle. A part associated with the instrument, switch or the like is engaged in an aperture in the mounting frame, and the mounting frame and said part include co-acting parts for pivotally interconnecting said part and the frame. In addition, said part and said frame include co-acting releasable catch means positioned in use between the axis about which the part can pivot relative to the frame, and the passenger compartment of the vehicle said co-acting catch means serving to hold the part against pivotal movement relative to the frame until the part has sufficient force applied thereto to release said catch means. Sufficient force is applied to said part for example, in the event of an occupant of the vehicle striking the instrument, switch or the like when the vehicle is involved in a collision, whereupon said catch means is freed, and said part is free to pivot relative to the frame in a direction away from the passenger compartment of the vehicle, thereby minimizing the risk of injury to said occupant of the vehicle.

3,662,851

AIR-CUSHION VEHICLE WITH BRUSH SUPPORT

Harry E. Ramsey, Averill Park, N.Y., assignor to Air Cushion Vehicles, Inc., Poestenkill, N.Y.

Filed Feb. 25, 1970, Ser. No. 13,986
Int. Cl. B60v *1/00*
U.S. Cl. 180—116 1 Claim



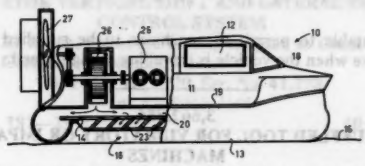
An air-cushion vehicle has a plurality of brushes mounted on the body within the boundary of the downwardly extending peripheral wall or skirt thereof, and extending downwardly to or below the level of the peripheral wall or skirt to support the vehicle while at rest without substantial deformation of the wall or skirt. The individual flexibility of the bristles allows the brushes to pass over obstacles, or to part so as to allow an obstacle to pass therethrough.

3,662,852

AIR CUSHION VEHICLE

Robert Vincent Taylor, 3 Forrestall Road, Elizabeth Downs, Australia

Filed Jan. 4, 1971, Ser. No. 103,622
Int. Cl. B60v *1/06, 1/16*
U.S. Cl. 180—117 11 Claims



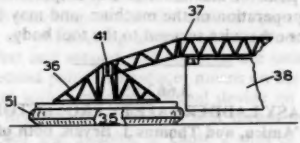
An air cushion vehicle of the type wherein air at superatmospheric pressure in a plenum supports a vehicle and the vehicle is provided with an inflatable bag skirt, there being a duct extending between a blower on the one hand and both the bag skirt and the plenum on the other, the plenum containing a door which can be opened or closed to control pressure differential between the inflatable skirt and the plenum whereby the vehicle may be lifted to take-off point with the plenum door closed, and take-off can be achieved by opening of the plenum door.

3,662,853

TRANSPORTERS

Norman Edward Love, Binstead, Ryde, Isle of Wight, England, assignor to British Hoovercraft Corporation Limited, Yeovil, Somerset, England

Filed Dec. 15, 1969, Ser. No. 885,136
Claims priority, application Great Britain, Dec. 19, 1968, 60,354/68
Int. Cl. B60v *1/00*
U.S. Cl. 180—121 9 Claims



A load transporter in which two supporting cushions of pressurized air are located one at each side of a load being moved, the load being supported by rigid beam members carried by rigid structures forming the upper boundary of the air cushions. In one embodiment the rigid beam members serve to join the rigid structures in spaced relationship, and are adapted to support the load either from below or above. In a further embodiment the rigid beam members are adapted to be secured to the sides of the load to permit taller loads to be transported, while maintaining the space relationship of the cushions. Propulsion of the transporter is either by towing, self-winching, or through the road wheels of a conventional vehicle being carried by the transporter.

3,662,854

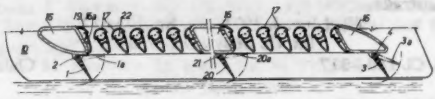
HIGH-SPEED GROUND EFFECT VEHICLES

Jean Henri Bertin, Neuilly-sur-Seine, France, assignor to Bertin & Cie, Boite Postale Plaisir, France

Filed Nov. 6, 1969, Ser. No. 874,149
Claims priority, application France, Nov. 8, 1968, 173226
Int. Cl. B60v *1/08, 1/04*
U.S. Cl. 180—121 13 Claims

A ground-effect vehicle comprising air cushions normally confined by solid walls, the front and rear walls of the front

and rear air cushions, symmetrically with respect to the longitudinal axis of the vehicle, including portions which are



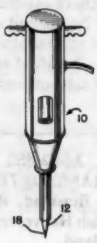
orientatable to permit the cushions to be supplied by ram pressure when the vehicle is travelling at high speed.

3,662,855

MUFFLED TOOL FOR VIBRATORY OR IMPACT MACHINES

Robert D. Adams, Little Greys, Wrington, Bristol, and Ian J. Sharland, 2 Honywood Road, Colchester, both of England

Filed May 4, 1970, Ser. No. 34,272
Int. Cl. F16f 7/12, 15/02, 15/12
U.S. Cl. 181—33 A 19 Claims



A tool for vibratory or impact machines, having a collar of vibration dampening material mounted around the tool body for reducing or muffling tool noise occurring during operation of the machines. The collar should be located at least around the point of maximum lateral amplitude of the tool body during operation of the machine, and may be enclosed in a casing or otherwise secured to the tool body.

3,662,856

EASY LADDER SAFETY PROTECTOR

Andre K. D'Amico, and Thomas J. Bryan, both of Rochester, N.Y., assignors to said D'Amico, by said Bryan

Filed Apr. 30, 1970, Ser. No. 33,389
Int. Cl. E06c 7/46, 5/36
U.S. Cl. 182—108 7 Claims

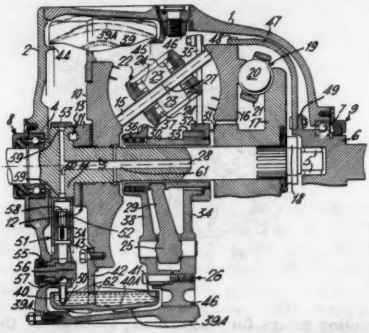
A ladder protector for a ladder having side rails is disclosed wherein electrical and bearing functions are provided for each end of the side rails by a flexible foam body member having a plurality of resilient closed gas filled cells. The protector includes elastic wall means for easy assembly and removal of the protector from each end of the ladder rails.

3,662,857

ROTARY SUMP WITH FLUID PICK-UP

Forbes George de Brie Perry, East Grinstead, England, assignor to National Research Development Corporation, London, England

Filed Nov. 24, 1969, Ser. No. 879,217
Claims priority, application Great Britain, Dec. 6, 1968, 58,217/68
Int. Cl. F01m 11/06
U.S. Cl. 184—6.2 10 Claims



The lubrication, cooling, etc., of a machine which cannot run flooded with fluid, or almost so, presents a problem when the machine is subject to changes of orientation, because the intake pipe of a fluid delivery pump or the like is starved except for one attitude of the machine when the pipe end is at the bottom. This problem is solved by the provision of a rotary sump in the form of an annular channel with inturned side walls.

The fluid pick-up dips into the body of fluid maintained in the channel by centrifugal force and may be connected to a pump inlet or may be self pressurizing by exploiting the ram effect.

The submerged end of the pick-up may be of hydrofoil section to counteract fluid starvation by the plowing of a channel in the fluid.

As far as possible, the channel surrounds rotary parts of the machine, to gather fluid flung off by them, the examples described being toroidal race rolling friction variable ratio transmission units. Rotating parts not so enclosed are surrounded parts of the casing, shaped to direct fluid towards the rotary sump.

The sump may be replenished from a fluid supply maintained at a predetermined pressure applied to a duct dipping into the fluid in the rotary sump to a depth where the centrifugal head of the fluid equals the predetermined pressure for chosen conditions of sump speed etc. If the sump level falls, the centrifugal head is insufficient to prevent fluid entering the sump through the replenishment duct. Otherwise the pressure at the duct outlet is either in balance or the centrifugal head exceeds the predetermined pressure. A closed-circuit assembly of machines is illustrated, having a driven machine running flooded with fluid with a scavenge pump providing the pressure for the replenishment duct of the rotary sump. A fluid cooler may be inserted in the circuit.

3,662,858

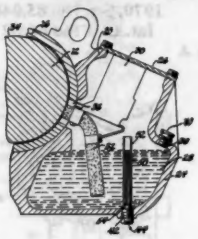
SELF-PURGING LUBRICANT RESERVOIR

David W. Peterson, Oak Brook, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1970, Ser. No. 67,513
Int. Cl. B01d 17/02; F01m 11/12
U.S. Cl. 184—103 R 1 Claim

In a preferred embodiment, the axle bearing caps of a railway locomotive traction motor include oil containing sumps from which lubricating oil is delivered by wick means to

lubricate the axle-carrier motor support bearings. Overflow conduit means are provided which connect with an interior portion near the bottom of the sump and extend upwardly to an overflow outlet that is open to atmosphere and located at approximately the desired maximum oil level in the sump.



When oil is added to the sump in excess of that required to reach the maximum level, the excess volume is forced from the bottom of the sump, out through the overflow conduit, thereby removing water and other contaminating liquids which are heavier than oil and settle to the bottom of the sump.

3,662,859

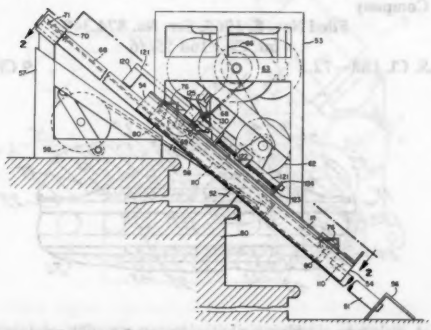
STAIRWAY ELEVATOR

Henry K. Flinchbaugh, 930 Arlington Road, York, Pa.

Filed Sept. 21, 1970, Ser. No. 73,760

Int. Cl. B66b *9/06*

U.S. Cl. 187—12 **7 Claims**



In a stairway elevator unit riding on tubular tracks mounted on the steps of a stairway, a carriage riding on the tracks and carrying a car frame, the car frame and carriage being driven by a motor powered winch which winds or unwinds a cable anchored at the top of the stairway, so as to raise or lower the elevator unit, the car frame being supported on the carriage by a support assembly, the position of which is controlled by the cable so as to support the car frame upward and outward from the inclined track when the cable is taut, and to drop the car frame downward and inward toward engagement with the inclined tracks when the cable is not taut. The support mechanism comprises an idler pulley normally supported by the cable, the idler pulley being mounted on an idler shaft, and a two member toggle controlled by the idler shaft and pivotably interconnecting the car frame and the carriage shaft. A channeled track member rigidly attached to the car frame rides on the carriage shaft such that when the cable is taut, the toggle holds the carriage shaft in position at the rear of the channel member, thus carrying the car frame in a forward and elevated position; when the cable is not taut, the toggle positions the carriage shaft to the front of the channel member, thus carrying the car frame in a backward and lowered position, engaging wedge members of the car frame with the tubular track so as to lock the car frame on the track and hold it securely. Movement of the car frame downward with respect to the carriage also activates an override safety switch which, when activated, prevents further drive by the motor.

3,662,860

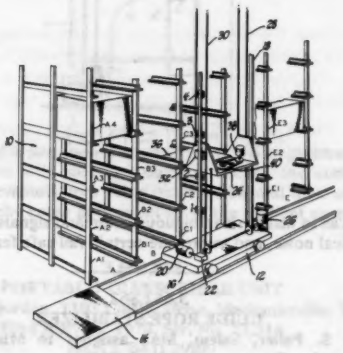
ELEVATOR VERTICAL SHIFT AND LATERAL DOLLY CONTROL SYSTEM

Arthur R. Burch, Plainwell, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed May 28, 1970, Ser. No. 41,278

Int. Cl. B66b *1/46*

U.S. Cl. 187—29 R **10 Claims**



An automatic control system is disclosed for an elevator of the type adapted for material handling in an automatic warehouse. The control system includes means for moving the elevator selectively to one of two different vertical null positions in accordance with the desired operation of either depositing or withdrawing a material unit from an adjacent bin. The first and second null positions are established by a first and second pair of transducer means on the elevator car which coact with a reference signal device on the elevator mast. The first and second transducer means may be selectively enabled and disabled to cause a shift of the elevator from one null position to the other. The elevator car is provided with a lateral dolly movable between an extended position and a retracted position for the manipulation of the material unit. An automatic control system is provided for the lateral dolly to correlate the motion thereof with the vertical shift of the elevator between the null positions in a sequence dependent on whether a material unit is being deposited or withdrawn from the bin.

3,662,861

ELEVATOR CONTROL DISPENSING WITH TRAVELING CABLES

Gerome R. White, Tenafly, and Arnold M. Lawner, Rutherford, both of N.J., assignors to Whitesons Sales Corp., Hackensack, N.J.

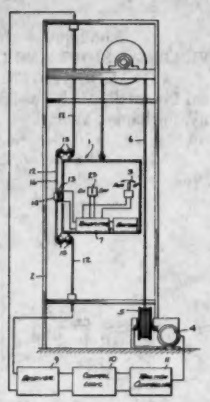
Filed Aug. 14, 1969, Ser. No. 850,046

Int. Cl. B66b *1/16*

U.S. Cl. 187—29 R **11 Claims**

"Up slow," "Down slow," "Up Fast," and "Down Fast" command signals in the form of magnetic flux from an elevator car are transmitted to a hoist motor at an end of the shaft, using ferromagnetic flux to magnetically couple a transmitter in the car and a receiver at the motor to a cable in the shaft or to a fixed structural member of the shaft either of which acts as the secondary of a transformer coupling the receiver to the transmitter. The transmitter-receiver system operates

at low frequencies (between about 300 to 1,200 cycles/sec.) to avoid electromagnetic radiation and its signals are so



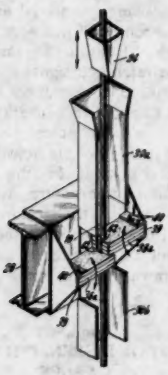
coded as to insure unambiguous command signals immune to electrical noise, and to provide certain fail-safe features.

3,662,862

GUIDE ROPE STABILIZER

Harry S. Poller, Salem, Mo., assignor to Missouri Lead Operating Company, New York, N.Y.

Filed Oct. 5, 1970, Ser. No. 77,876
Int. Cl. B66b 7/02
U.S. Cl. 187—95 15 Claims



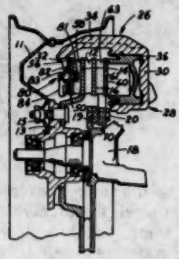
A device for stabilizing fixed guide ropes in a mine shaft elevator system comprises flexible leaf members secured at one of their ends along and transversely to the shaft. In their normal position, the free ends of the leaf members transversely engage the guide ropes and prevent their undesired movement. When the guide rope shoe carried on a cage passes by the device, the leaf members are radially flexed and thus separated to permit the shoe to pass thereby, after which the leaf members return to the initial guide rope stabilizing position.

3,662,863

BRAKE LINING WEAR INDICATOR

Edward K. Dombeck, South Bend, Ind., assignor to The Bendix Corporation

Original application Nov. 21, 1968, Ser. No. 777,762, now Patent No. 3,556,046. Divided and this application Oct. 29, 1970, Ser. No. 85,048
Int. Cl. F16d 66/02
U.S. Cl. 188—1 A 5 Claims



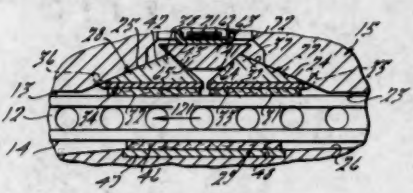
This invention relates to a device providing a warning signal to the vehicle operator when the brake lining has worn a predetermined amount. The signal device comprises a weight which is released after brake lining wear to engage the brake assembly for an audible signal.

3,662,864

DISK TYPE BRAKE WITH SPLIT PRIMARY SHOE

Anthony C. Evans, Westland, Mich., assignor to Kelsey-Hayes Company

Filed Nov. 5, 1969, Ser. No. 874,349
Int. Cl. F16d 55/46
U.S. Cl. 188—72.2 9 Claims



A disk type parking brake embodying a split primary shoe with a wedge-like actuator. The wedge-like actuator holds the split primary shoes against inclined surfaces of the caliper for effecting a self servo action upon the shoes. A lever type actuating mechanism is incorporated and pivotal movement of an actuating lever accomplishes an automatic adjustment of the mechanism to compensate for wear.

3,662,865

AUTOMATIC ADJUSTER FOR SHOE DRUM BRAKE

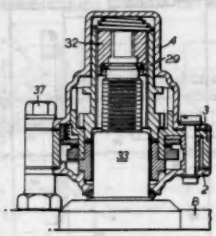
Charles Newstead, and Norman S. Moss, both of Birmingham, England, assignors to Girling Limited, Birmingham, England

Filed June 23, 1970, Ser. No. 49,114
Claims priority, application Great Britain, June 25, 1969, 32,109/69
Int. Cl. F16d 65/56
U.S. Cl. 188—196 F 8 Claims

A bolt on adjuster unit for auto-adjustment of the manual adjuster spindle of a drum brake comprises an actuating spring means which is loaded progressively and incrementally by successive mechanical input signals corresponding to brake shoe movements; when a predetermined number of signals have been received, the spring means is automatically

released to drive a transfer means which operates to effect adjustment of the spindle.

The unit also exhibits a novel manual re-setting arrangement in which a final driven member of the mechanism is



formed with a ring of gear teeth in constant mesh with a pinion. A manually depressable and rotatable plunger is used to engage and rotate the pinion and driven member, and at the same time to break the driving engagement between the driven member and the rest of the transmitting mechanisms.

3,662,866

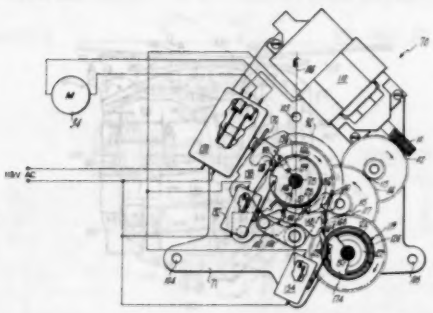
DRIVE UNIT FOR FLUID DELIVERY PUMP

Silvio Conte, East Hartford, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Sept. 14, 1970, Ser. No. 71,997

Int. Cl. F16d *13/10*; B67d *5/24*; G06c *15/42*

U.S. Cl. 192—.02 **6 Claims**



A gasoline delivery pump with a resettable delivery register, a ticket printer mounted above the register operable for recording the amount of each fluid delivery and a two-phase drive unit having a first drive shaft connected to a register reset shaft for resetting the register to "0" prior to the commencement of each fuel delivery and a second drive shaft connected for operating the printer after the completion of each fluid delivery. The drive unit comprises an electrical drive subassembly adapted to be selectively mounted in an explosion-proof housing in either of two reverse positions for selectively rotating the drive shafts in either direction of rotation for facilitating selectively mounting the drive unit on either side of the register.

3,662,867

FORCE TRANSMITTING COUPLING

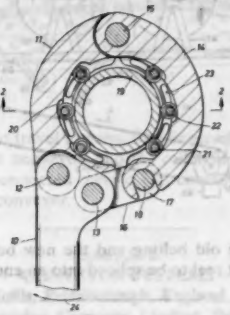
Robert B. Kinzbach, 6203 Valley Forge, Houston, Tex.

Filed Mar. 13, 1970, Ser. No. 19,249

Int. Cl. F16d *15/00*, *41/06*

U.S. Cl. 192—45 **10 Claims**

A coupling for use with two relatively movable members to transmit force between said members comprising a resilient element having a plurality of convolutions positioned between the members and a solid core element positioned within the convolutions of said resilient element, said resilient element being positioned such that the relative movement of said members urges said convolutions into frictional engagement with both of said members. The solid core



element is of a size such that when frictional engagement of said members with said convolutions occurs, the convolutions are prevented from being distorted beyond their elastic limit to thereby cause permanent set of the resilient element.

3,662,868

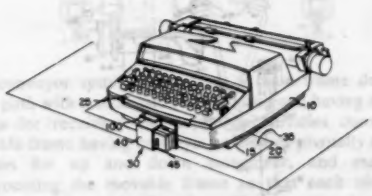
PORTABLE TRANSCRIBER UNIT

Albert Paul Jordan, 1103 Colony Drive, Mechanicsville, Va.

Filed Apr. 30, 1970, Ser. No. 33,314

Int. Cl. B41j *29/00*

U.S. Cl. 197—180 **4 Claims**



A transcriber unit adapted to attach to a typewriter or typewriter desk in close proximity to the operator's hands for ease of operation, the transcriber having a transcriber switch preferably located near the typewriter spacer bar. A portable magnetic tape recorder placed in the transcriber unit is rewound and the recorded portion played by means of the transcriber switch in accordance with the operator's speed and desire.

3,662,869

METHOD AND APPARATUS FOR CHANGING CONVEYOR BELT

Sherman Carl Burkitt, Arlington Heights, Ill., assignor to FMC Corporation, San Jose, Calif.

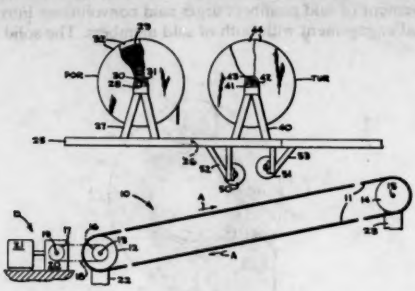
Filed Nov. 16, 1970, Ser. No. 89,961

Int. Cl. B65g *15/00*

U.S. Cl. 198—1 **12 Claims**

A pay-out reel containing new belting is positioned adjacent the conveyor. The old endless belt is severed and the leading edge thereof is connected to a take-up reel. The leading edge of the new belting is temporarily connected to the trailing edge of the old belting so that when the conveyor is driven, the old belt will pull the new belting around the conveyor. The new belting is trained over the take-up reel to

rotate the take-up reel. When the new belting is completely around the conveyor, the leading edge thereof is disconnected from the old belting and the new belting is severed from the pay-out reel to be spliced into an endless belt.

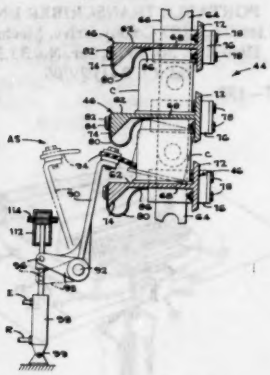


3,662,870

CONTAINER RE-ORIENTING MECHANISM

Adil A. Mughannam, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 24, 1970, Ser. No. 66,513
Int. Cl. B65g *47/22*
U.S. Cl. 198—29 **5 Claims**



A container orienting device, for a hydrostatic cooker of the type having a conveyor comprising multiple I-beam carriers thereon, for returning containers into a proper orientation prior to reaching the discharge point. Containers which have become misoriented due to articulation of the conveyor are properly reoriented by a container orienting device comprising a pivotal finger which is inserted between said I-beam carriers in timed relation to the motion thereof for engaging the side surface of the containers and urging them into a properly oriented position.

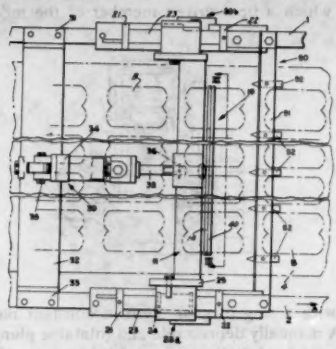
3,662,871

ARTICLE ALIGNER FOR A CONVEYOR SYSTEM

Paul J. Koepnick, Grand Rapids, Mich., assignor to Werner Lehara, Inc., Grand Rapids, Mich.

Filed Sept. 16, 1970, Ser. No. 72,586
Int. Cl. B65g *47/26*
U.S. Cl. 198—30 **13 Claims**

For aligning articles on a conveyor in straight rows extending transversely of the conveyor. A device is provided which includes an aligner element with means for moving the aligner element into an upper and lower position out of or into engagement with articles. Actuator means is provided for moving the aligner also in a direction longitudinally with the conveyor for contacting the articles from behind and aligning them in straight lines transversely and longitudinally of the conveyor.

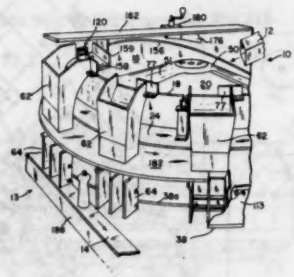


3,662,872

APPARATUS FOR ORIENTING AND FEEDING ARTICLES

John C. Nalbach, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed July 10, 1969, Ser. No. 840,739
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AA **26 Claims**



Apparatus for orienting and feeding lightweight plastic bottles or the like having a rotating bowl in which a supply of randomly arranged bottles is placed, a plurality of chutes spaced around the bowl for rotation therewith, with each chute having a bottle receiving opening at the upper edge of the bowl. A plurality of vertically reciprocable bottle pushers are mounted within the bowl and rotate therewith, each pusher being operatively associated with one of the chutes. As the bowl rotates, each pusher moves a bottle up a stationary helical discharge track from the top of which the bottles are deposited in a predetermined oriented position into the respective associated chute, with the bottle eventually being transferred onto a linear conveyor which is arranged along a tangent to the path of rotation of the bottles as they are positioned in the rotating chutes.

3,662,873

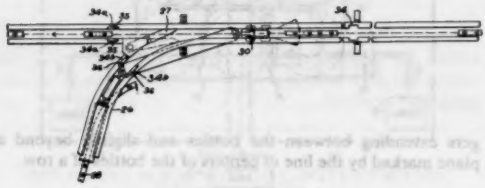
CONVEYOR SYSTEM

Ivan L. Ross, Birmingham, Mich., assignor to American Chain & Cable Company, Inc., New York, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,780
Int. Cl. B65g *37/00;* **B61b** *13/00*
U.S. Cl. 198—78 **12 Claims**

A conveyor system including a first load supporting track and a second load supporting track with an intermediate

transfer portion. A powered conveyor is provided in association with each of the first and second tracks. A plurality of carriers are provided. Each of the carriers has a first dog that is in position for normal engagement with the pusher member of the conveyor and a second dog that is normally urged to an operative carrier pushing position but is held by the track



out of operative position. At a transfer point a portion of the track is cut away for a distance sufficient to permit the second dog to move to operative carrier transferring position. Beyond the transfer point, a portion of the track is again cut away to permit the second dog to be cammed downwardly out of operative position.

3,662,874

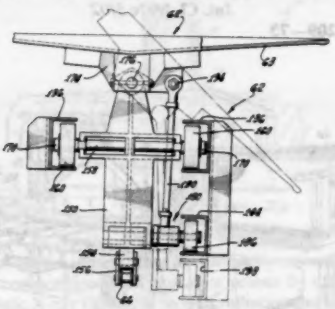
PARCEL SORTING CONVEYOR SYSTEM

Donald C. Muller, Whittier, Calif., assignor to Butz Engineering Corporation, Azusa, Calif.

Filed Oct. 12, 1970, Ser. No. 79,928

Int. Cl. B65g *17/18*

U.S. Cl. 198—155 **14 Claims**



An endless parcel sorting conveyor system embodying a plurality of contiguous parcel receiving receptacles movable through a predetermined orbit. Deflecting means associated with each of said parcel receiving receptacles including track elements. Said deflecting means is activatable upon command to tilt said receptacles from a normal parcel receiving position to the right or left of the line of travel in said orbit discharging by gravity parcels thereon at predetermined positions. The parcel sorting conveyor system also includes reset deflector means selectively positioned therealong adapted to return said parcel receiving receptacles to said normal parcel receiving position.

3,662,875

APPARATUS FOR ARRANGING SUBSTANTIALLY LAMINAR ARTICLES INTO SPACED GROUPS

Jacob Salomon, 10 Weizman Square, Holon, Israel

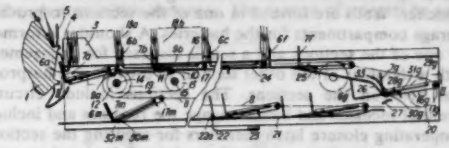
Filed Nov. 30, 1970, Ser. No. 93,736

Claims priority, application Great Britain, Dec. 1, 1969, 58,643/69

Int. Cl. B65g *15/00*

U.S. Cl. 198—180 **15 Claims**

A counting mechanism in which a stream of articles passing along a guide are interposed with regularly arranged spacer fingers which expand to bunch up the articles into discrete separated groups prior to delivery at for example a boxing station. Expansion of the fingers may be effected by caus-



ing the fingers to travel in pairs, one finger of each pair being driven by a first conveyor, and the other finger of each pair being slidably connected thereto and contacted by a second, slower moving conveyor.

3,662,876

CONVEYOR SYSTEMS

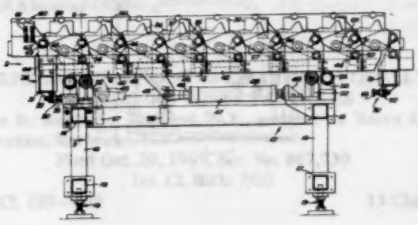
John Gordon Hollis, Peterborough, England, assignor to The Newall Engineering Company Limited, Peterborough, England

Filed Sept. 1, 1970, Ser. No. 68,600

Claims priority, application Great Britain, Sept. 12, 1969, 45,095/69

Int. Cl. B65g *25/04*

U.S. Cl. 198—219 **4 Claims**



A conveyor system comprising a main frame defining a fixed path with a succession of stations each having receiving means for receiving and supporting articles conveyed, a movable frame having conveying elements pivotally mounted thereon for up and down movement, and means for reciprocating the movable frame so that each element is moved between a pair of stations. The operation is such that each element lifts an article from a station, moves to the second station of its pair carrying the article, lowers the article at the second station, and returns to the first station. Means may be provided for rendering inoperative at least some of the elements independently of the operation of the other elements.

3,662,877

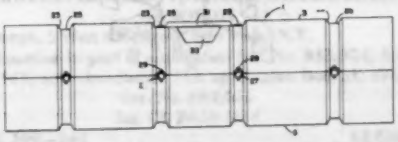
MISSILE LAUNCHER CONTAINER

Donald M. McDaniel, Guntersville, Ala., assignor to The United States of America as represented by the Secretary of the Army

Filed Mar. 31, 1970, Ser. No. 24,293

Int. Cl. F42b *37/00, 39/00*; B65d *85/30*

U.S. Cl. 206—3 **1 Claim**



A container for a missile launcher and batteries for operating the launcher consisting of shell of rectangular cross sec-

tion including a pair of sections that are provided with a plurality of contiguous cavities. Padded seats are located in the cavities for supporting the launcher and a pair of cushions is placed in each section for restraining end movement of the launcher. Walls are formed in one of the sections to provide storage compartments for the batteries. A shoulder is formed on one of the sections and a seal is disposed for engagement with a shoulder of the other section to provide a waterproof seal between the sections. The sections include circumferential recesses and bands engage the recesses and include cooperating closure latch members for securing the sections together. A handle is secured to a pair of the bands to provide a means for carrying the container. The shell is provided with a depression to allow clearance adjacent the handle.

3,662,878

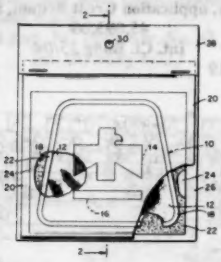
DISPLAY PACKAGE OF A SCHIFFLI-EMBROIDERED EMBLEM PATCH

E. Henry Conrad, P.O. Box 537, Weaverville, N.C.

Filed Dec. 2, 1970, Ser. No. 94,264

Int. Cl. B65d *65/14*

U.S. Cl. 206—45.33 **5 Claims**



A new article of commerce, a display package, consisting of a Schiffli-embroidered emblem patch and a separable laminate of a solid thermoplastic adhesive and paper enclosed in a transparent bag mounted on and sealed by a mounting card.

3,662,879

DIVIDER PARTITIONS FOR BOTTLE CARRIERS

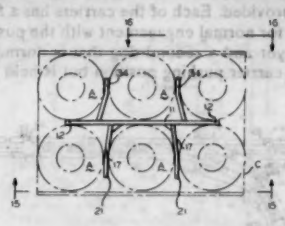
Charles Robert Helms, Barto, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Aug. 1, 1969, Ser. No. 846,661

Int. Cl. B65d *5/48, 71/00*

U.S. Cl. 206—65 E **9 Claims**

A divider partition for a bottle carrier having bottles arranged in a pair of side by side rows, the divider partition being formed from a cut and scored blank to provide fingers extending laterally therefrom, the distal portions of such fingers extending between the bottles and slightly beyond a plane marked by the line of centers of the bottles of a row.



3,662,880

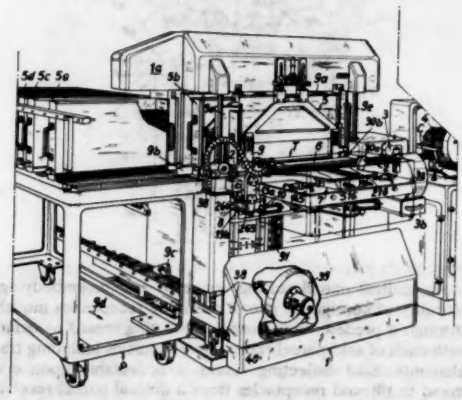
METHOD AND APPARATUS FOR MANIPULATING ROD-SHAPED ARTICLES

Horst Kochalski, Hamburg-Lohbrugge; Willy Rudszinat, Dassendorf; Harry David; Otto Erdmann, both of Hamburg-Bergedorf; Ludwig Rode, Neu Boernsen, and Hans Suck, Hamburg-Neuengamme, all of Germany, assignors to Hauni-Werke Koerber & Co. KG, Hamburg-Bergedorf, Germany

Original application Mar. 6, 1969, Ser. No. 806,035, now Patent No. 3,519,143, which is a continuation of application Ser. No. 533,942, Mar. 14, 1966, now abandoned, which is a division of application Ser. No. 306,368, Sept. 3, 1963, now Patent No. 3,245,558, which is a division of application Ser. No. 181,669, Mar. 22, 1965, now Patent No. 3,190,459. Divided and this application May 4, 1970, Ser. No. 34,357

Int. Cl. B07c *3/02*

U.S. Cl. 209—73 **5 Claims**



Cigarettes of multiple unit length are severed to yield pairs of shorter cigarettes which form two rows. The cigarettes of one row are inverted end-for-end and added to the other row to form a single third row. The cigarettes of the third row are thereupon tested for the presence of defects and the defective cigarettes are segregated so that the third row contains only satisfactory articles which are stacked in chargers.

3,662,881

MODULE HANDLING APPARATUS

William J. Fineran, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

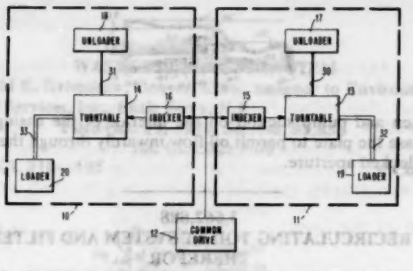
Filed Jan. 29, 1971, Ser. No. 110,940

Int. Cl. B07c *3/12*

U.S. Cl. 209—73 **18 Claims**

Method and apparatus for unloading articles from storage for performing operating processes on them and thereafter

loading the articles for storage into categories determined by the processes. The articles are stored in stacked trays and automatically moved to a station for unloading to a processing



station such as an article tester. After testing, the articles are sorted based on the test results and again automatically moved to stations for loading into stacked trays.

3,662,882

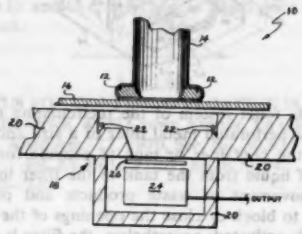
METHOD AND APPARATUS FOR QUALITY CONTROL OF EXPLOSIVE PRIMERS BY CHARACTERISTIC X-RAY EMISSION

Arthur S. Obermayer, Newton, Mass., assignor to Molecular Research Corporation, Cambridge, Mass.

Filed June 25, 1969, Ser. No. 836,248

Int. Cl. B07c *5/346*

U.S. Cl. 209—111.5 **10 Claims**



A method and apparatus for indirectly measuring the weight or composition of an explosive primer by utilizing the characteristic X-ray emissions from a radiation excitable constituent of the primer. The explosive primer is exposed to an external source of ionizing radiation which induces characteristic X-ray emissions of the selected primer constituent. The quantity of the emitted characteristic X-rays is determined by an ionizing radiation energy-resolving detection system. Since the quantity of the emitted characteristic X-rays is a function of the amount of the excitable constituent present in the primer, determination of the quantity of the X-rays emitted provides an indirect measurement of the weight of the primer.

3,662,883

BIRD SWING DETECTOR

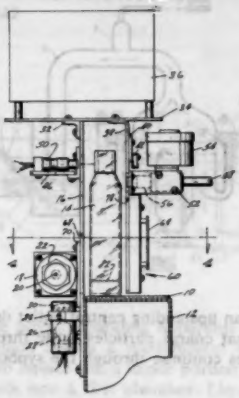
James R. Sager, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Dec. 7, 1970, Ser. No. 95,589

Int. Cl. B07c *5/342*

U.S. Cl. 209—111.7 **5 Claims**

Apparatus for inspecting glass containers to determine the presence of the defect termed "bird swing." Containers to be inspected are moved in series on a moving belt conveyor to an inspection position where a rotating multifaceted mirror causes a beam of light to sweep the container sidewall from bottom to top. If no defect is present, the beam of light passes through the container sidewall. A pair of elongated photosensitive elements are positioned adjacent to the container to view the illuminated wall portion of the container at an angle with respect to the direction of the moving light beam. Should a "bird swing" defect be present, the light beam is deflected from its normal position into one or both of the photosensitive elements. The receipt of a signal by one



or the other of these photosensitive elements activates a reject circuit which causes the container having the defect to be rejected from the stream of bottles. The reject mechanism takes the form of a stream of high pressure air under the control of a solenoid valve.

3,662,884

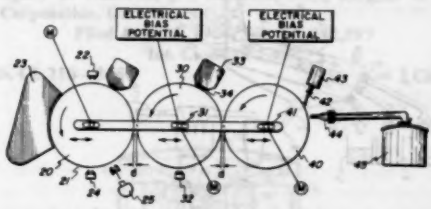
METHOD AND APPARATUS ELECTROSTATICALLY CLASSIFYING TONER PARTICLES

Bruce R. Robinson, Pittsford, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Oct. 20, 1969, Ser. No. 867,739

Int. Cl. B03c *7/00*

U.S. Cl. 209—129 **13 Claims**



Method and apparatus to electrostatically classify electroscopic toner particles according to size. Particles to be classified are supported on a photocondctive surface and electrically charged to one polarity. An electrically conductive surface spaced a predetermined distance from the charged particles is electrically biased by a potential of opposite polarity to collect toner particles which are attracted to the surface in response to the magnitude of the biasing voltage and the between-surface spacing.

3,662,885

APPARATUS FOR THE HYDRAULIC CLASSIFICATION OF SOLIDS

Thor Dorph, 5 West 63d Street, New York, N.Y.

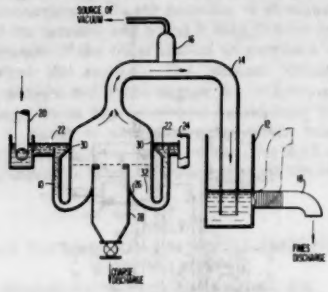
Continuation-in-part of application Ser. No. 853,324, Aug. 27, 1969, now abandoned. This application Dec. 31, 1969, Ser. No. 889,608

Int. Cl. B03b *3/34*

U.S. Cl. 209—161 **12 Claims**

Hydraulic classifying apparatus for liquid slurries of mixed coarse and fine particles includes first and second syphon

connected containers and means for maintaining syphon flow between the containers while continuously feeding slurries to be separated to the first container. An enlarged inlet portion of the syphon is positioned within the first container and



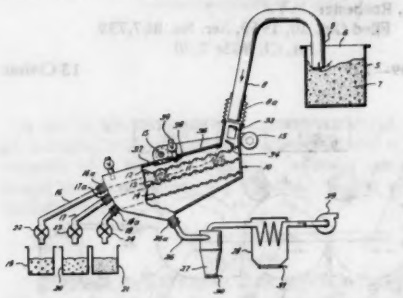
together with an upstanding central outlet defines a separating zone so that coarse particles settle through the central outlet and fines continue through the syphon to the second container.

3,662,886

HANDLING APPARATUS FOR PARTICULATE DRY PRODUCT

Alvin B. Kennedy, Jr., Alvin, Tex., assignor to Catalyst Services, Inc., Alvin, Tex.

Filed Feb. 5, 1970, Ser. No. 8,919
Int. Cl. B07b *1/28*
U.S. Cl. 209—250 **4 Claims**



Particulate dry product of more-or-less fragile nature, such as pelletized catalysts, is transported by suction in an air stream to a vibrating screen system and the classified particles caught by the screen or screens are directed through air lock devices to collection receptacles. The air and fine material which pass through the screens continue in the closed system through further separating devices for dust and fine particles and thence through the suction pump.

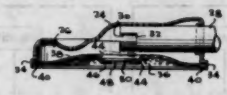
3,662,887

OIL PUMP INLET STRAINER

Walker S. Uhlhorn, Jr., Germantown, Tenn., assignor to Ripley Screen and Strainer Company, Collierville, Tenn.

Filed Jan. 21, 1970, Ser. No. 4,586
Int. Cl. B01d *29/04*
U.S. Cl. 210—131 **10 Claims**

A sump immersed pump inlet strainer in which a metal casing connected to a pump inlet has a circular inflow opening with a straining screen extending across the opening and peripherally retained in the opening with the screen having a central crimped protrusion extending outwardly and holding a metal plate in place in blocking relationship with respect to an aperture in the screen so that movement of the screen from an outwardly bowed position with respect to the inflow opening to an inwardly bowed position due to clogging of the



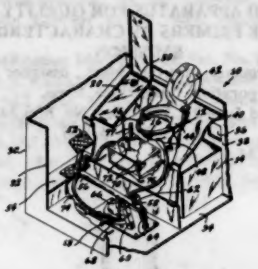
screen and pump suction on the interior of the casing will release the plate to permit oil flow inwardly through the then unblocked aperture.

3,662,888

RECIRCULATING TOILET SYSTEM AND FILTER THEREFOR

James Morgan Kemper, Hollywood, Calif., assignor to Monogram Industries, Inc., Los Angeles, Calif.

Filed Apr. 29, 1971, Ser. No. 138,727
Int. Cl. C02c *1/26*
U.S. Cl. 210—167 **4 Claims**



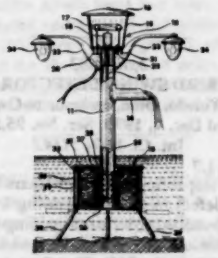
A portable toilet system of the recirculating type is provided with a perforated metal filter of a size and open area relative to the container or tank to provide for a minimal flow rate of liquid from the tank to the filter interior. This prevents movement of waste products and paper which would tend to block or close the openings of the filter when the system is activated; nevertheless, the filter is simply constructed and economical to manufacture and assemble.

3,662,889

WATER CLEANER

Shigehiro Takarabe, 5-28, Nishi, 3-chome Omori, Ota-ku, Tokyo, Japan

Filed June 18, 1970, Ser. No. 47,213
Claims priority, application Japan, Dec. 25, 1969, 44/122397; Dec. 26, 1969, 44/123062
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **3 Claims**



The present invention provides a water cleaner for automatically circulating the water body in a pond or the like for keeping of fishes for amusement and/or food for filtration,

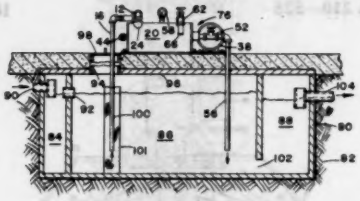
purification, and aeration. A filter unit driven by a motor may be located at any depth and position in the pond in a very stabilized manner. A lighting unit is installed above the water surface so as to facilitate the feed, viewing, and luring fishes at night.

3,662,890

WASTE TREATMENT SYSTEM

Derald E. Grimshaw, Denver, Colo., assignor to Environmental Services, Inc., Little Ferry, N.J.

Filed Oct. 19, 1970, Ser. No. 81,838
Int. Cl. C02c 1/08
U.S. Cl. 210—195 6 Claims



A system and method of treating contaminated liquid, such as domestic waste liquid in a septic tank, by progressively withdrawing part of the liquid into a closed chamber and aerating it under pressure to permeate it extensively with clean ambient air, and discharging the saturated liquid into the septic tank, or other type of tank if different waste liquid from domestic waste is being treated, to enhance the reduction of B.O.D. and/or C.O.D. of said liquid prior to discharge from the tank.

3,662,891

APPARATUS FOR CONFINING FLOATING MATERIALS

Edward E. Headrick, 4900 Crown Avenue, La Canada, Calif.

Filed Apr. 22, 1970, Ser. No. 30,927
Int. Cl. B01d 21/02; E02b 15/04
U.S. Cl. 210—242 12 Claims

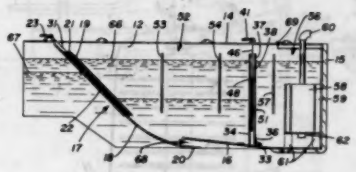
A boom arrangement for the collection of oil or other material floating on the surface of water, the boom being suited for towed or stationary positioning. The boom comprises two flexible arms defining the sides of a converging channel and a harness located between the arms for providing the load bearing structure for supporting and maintaining the boom in proper configuration whether being drawn through the water or being used in a station keeping application. A plurality of wave attenuators may be located near the narrow end of the channel with a controllable gate linking this end of the boom and a collection device located on the side of the gate opposite the narrow end.

3,662,892

IMMISCIBLE LIQUID SEPARATING APPARATUS

Robert M. Sorensen, Bryan, Tex., assignor to Ocean Pollution Control, Inc., Dallas, Tex.

Filed Oct. 21, 1970, Ser. No. 82,568
Int. Cl. B01d 17/02
U.S. Cl. 210—242 4 Claims



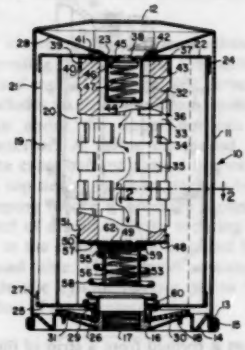
An immiscible liquid separating apparatus having an adjustable weir which admits a predominant portion of the lighter of the two liquids and a minor portion of the heavier of the two liquids into a first chamber. Liquid in the first chamber may communicate with a second chamber over another adjustable weir to permit the lighter of the two liquids to flow over the top of the second weir into the second chamber. The first chamber is provided with an aspirating slot disposed generally transversely across the bottom of the chamber to permit the heavier of the two liquids admitted to the first chamber to be withdrawn therefrom upon movement of the apparatus through the liquid body. The lighter of the two liquids collected in the second chamber may be removed by pump means disposed within the second chamber or through a line connected to the pump means positioned externally of the chamber.

3,662,893

FILTER CARTRIDGE

Kingsley E. Humbert, Jr., Gastonia, N.C., assignor to Wix Corporation, Gastonia, N.C.

Filed Aug. 25, 1969, Ser. No. 852,597
Int. Cl. B01d 27/06
U.S. Cl. 210—315 2 Claims



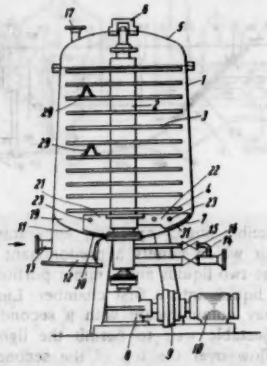
A filter cartridge having a pleated paper filter element therein and concentrically therewith a molded porous filter element that has a resin incorporated therein, the molded element having an outer surface configuration providing channels for the flow of fluid and with the molded element providing a support for the inner peaks of the pleated paper filter element.

3,662,894

CENTRIFUGAL CLEANING FILTER

Herbert Bockler, Schwabisch Gmund, Germany, assignor to Schenk-Filterbau GmbH, Waldstetten, Germany

Filed July 2, 1970, Ser. No. 51,978
Claims priority, application Germany, July 25, 1969, G 69 29 523.4
Int. Cl. B01d *35/16, 29/42*
U.S. Cl. 210—330 **13 Claims**



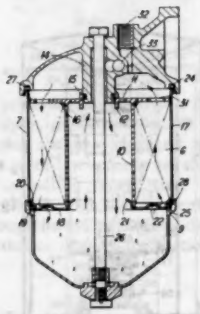
A centrifugal filter having a vertical rotatable shaft supporting horizontal filter elements within a housing. The housing bottom has an outlet aperture swept by ejector shovels mounted on the shaft, the shovels having portions of different inclination.

3,662,895

FILTER ELEMENTS FOR LIQUID FILTERS

Derrick Percival Tuffnell, and Stanley William Kemp, both of Southampton, England, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 25, 1971, Ser. No. 109,208
Claims priority, application Great Britain, Jan. 28, 1970, 4,070/70
Int. Cl. B01d *27/06*
U.S. Cl. 210—439 **4 Claims**



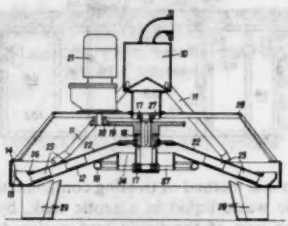
A filter element is formed from a strip of filter paper having a regularly spaced series of transverse fold lines, two lines of adhesive being respectively applied to one edge on one face of the strip and to the opposite edge on the opposite face of the strip, the strip then being formed into pleats by folding about the transverse fold lines, the two halves of each pleat being sealed to each other at one end of the assembly but at the other end being sealed to the adjacent halves of adjacent pleats to each side thereof, so as to form a series of pockets which are open alternately at the top and the bottom of the assembly, and the ends of the assembly of pleats being sealed to each other to form it into a hollow tubular element which may then be fitted into a housing with a center tube and end plate assembly, the element being sealed at one end to the housing and at the other end to the center tube.

3,662,896

APPARATUS FOR DRAINING LIQUID FROM A SUSPENSION

Peter Pink, Klein Rotz near B. Korneuburg, and Rupert Dallner, Vienna, both of Austria, assignors to Chemie Und Metall Gesellschaft M.B.H. Rheax, Vienna, Austria

Filed June 17, 1970, Ser. No. 46,918
Claims priority, application Austria, June 19, 1969, 5804/69
Int. Cl. B01d *12/00*
U.S. Cl. 210—525 **10 Claims**



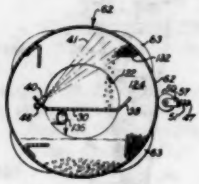
Water is drained from sand by moving the slurry upwardly along a conical support surface by a plurality of entrainment shovels which are arranged in a spiral and are rotated over the surface. While successive shovels move ever drier portions of the sand upwardly along the surface to a discharge opening at the apex of the conical support surface, the water runs down the surface.

3,662,897

CUTTING SAMPLE RECOVERY DEVICE

Kenneth O. Huff, 275 Townsend Building, Casper, Wyo.

Filed Sept. 8, 1970, Ser. No. 69,996
Int. Cl. B01d *21/06*
U.S. Cl. 210—523 **18 Claims**



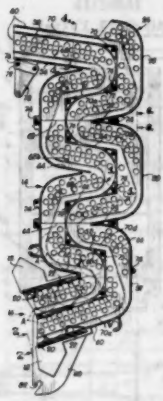
A sampling device for recovery of cuttings suspended in a fluid, such as a drilling mud containing suspended cuttings produced in oil well drilling, comprising a slowly driven rotary drum having openings in its ends and riffle plates and into which the drilling fluid returning from an oil well is continuously discharged to settle and deposit the cuttings on the lower wall of the rotating drum, the supernatant fluid being continuously passed outward through an open end of the drum, the drum having vanes mounted on its wall which lift the settled cuttings, a series of nozzles disposed in the drum which discharge streams of water upon and wash mud from the cuttings in each vane as it unloads cuttings upon an angularly mounted trough centrally through the open ends of the drum, the trough having perforations at one end to classify the washed cuttings passing downward and outward of the drum, and having containers mounted beneath the perforations to collect the washed recovered cuttings.

3,662,898

SECTIONAL SERPENTINE DISPENSING COLUMN HAVING MEANS PREVENTING ARTICLE JAMMING

John W. Baxendale, Kansas City, Mo., assignor to The Vendo Company, Kansas City, Mo.

Filed Apr. 24, 1970, Ser. No. 31,605
Int. Cl. A47f 7/00
U.S. Cl. 211—49 5 Claims



A sectional, double-depth serpentine column for a dispensing or vending machine has a pair of spaced vertical walls provided with inclined rails on their inner surfaces arranged to support the ends of cylindrical articles, such as canned beverages, in a serpentine stack for gravitational movement in unison as individual articles are delivered from the bottom of the column. Inwardly projecting, narrow beads on the inner wall surfaces extend in the direction of inclination of the respective rails and are spaced thereabove less than one-half the diameter of the articles for engagement by the ends of the articles below the center thereof in order to prevent such ends from contacting the wall surfaces and to provide minimum resistance to rotation of the articles as they engage the beads during downward travel. The column is a sectional assembly comprising an uppermost, a lowermost, and one or more intermediate sections, each of the three types of sections having different wall, rail and bead configurations designed to permit the number of intermediate sections to be varied in accordance with the desired article capacity, or permit complete elimination of intermediate sections if it is desired to provide a shorter column of reduced article capacity.

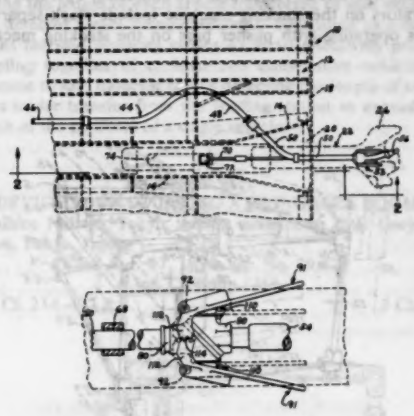
3,662,899

ANGLE COCK FOR AIR BRAKE TRAINLINE IN RAILWAY CARS

Robert W. Randolph, St. Charles, Mo., and Boris S. Terlecky, New York, N.Y., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed July 8, 1970, Ser. No. 53,210
Int. Cl. B61g 5/08
U.S. Cl. 213—1 R 5 Claims

An angle cock for a trainline is mounted centrally of the width of a railway car generally beneath the coupler. The angle cock comprises a valve movable between fully open and fully closed positions and a valve stem extending in a horizontal direction generally transversly of the car from opposite sides of the valve. A handle is mounted on each valve stem and is pivoted outwardly from a releasably locked position before rotation of the associated valve stem. After rotation of the valve stem and valve to the fully open or fully closed position the handle is pivoted inwardly to releasably lock the handle in position. The handles on opposite sides of the valve are interconnected so that the unlocking of one handle effects unlocking of the other handle therefore to permit rotation of the valve. Upon rotation of the valve to the fully open or fully closed position, the associated handle is pivoted inwardly to a locked position and simultaneous locking of the other handle is likewise effected.

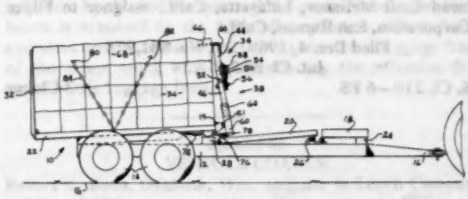


3,662,900

RETRIEVER ATTACHMENT FOR A BALE WAGON

Donald M. Grey, Selma, and Albert C. Cook, Kingsburg, both of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed July 29, 1970, Ser. No. 59,262
Int. Cl. B65g 57/32
U.S. Cl. 214—6 B 8 Claims



A retriever clamping device for attachment onto a bale wagon for providing the same with the additional capability of retrieving load stacks. The clamping device is generally T-shaped and includes an elongated beam having a cross bar attached thereto about the upper portions and extending laterally thereacross. A series of spaced apart tines are disposed on the cross bar and extend rearwardly for engagement with the top tier of the load stack to be retrieved. The T-shaped clamping device is pivotally mounted transversely the forward end of a load table by securing a mounting bar that is affixed to the clamp within mounted brackets extending from the load table. The clamp is actuated by a remotely controlled hydraulic cylinder whose piston is connected to the lower portion of the elongated beam.

3,662,901

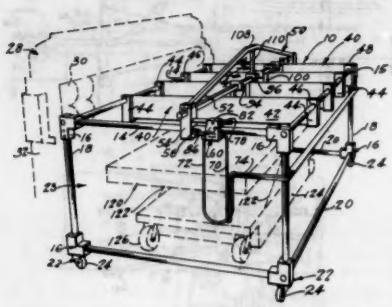
STACKING MACHINES

Eugene L. Brintley, Sr., 1042 Lanier Boulevard, N.E., Atlanta, Ga.

Continuation of application Ser. No. 575,701, Aug. 29, 1966, now abandoned. This application July 23, 1970, Ser. No. 64,053
Int. Cl. B65g 57/11
U.S. Cl. 214—6 H 9 Claims

A stacking machine which receives individual metal plates from a slitting machine that moves and slits a larger metal

plate into the smaller individual plates moving side-by-side and deposited and stacked by the present stacking machine on top of a lift table that lowers from time to time during the stacking operations. Adjustable pneumatically operated stack separators on the stacking machine include stack separator plates operating with pusher bars on the stacking machine



which reciprocate, receive and engage the pieces, cushion the shock and cause the pieces to drop into respective stacks. The stacking machines may be mounted on legs that are high enough to permit the insertion and removal of a conventional lift table such as the "Globe" lift table, a "Southward" lift table or a "Jarke" lift table.

3,662,902

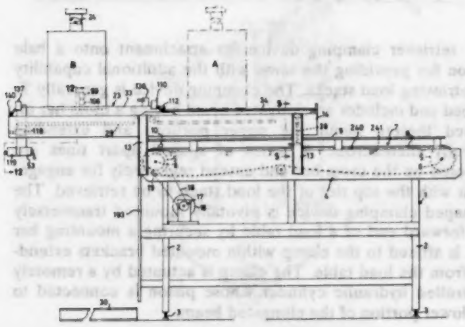
PALLETIZER

Konrad Emil Meissner, Lafayette, Calif., assignor to Filper Corporation, San Ramon, Calif.

Filed Dec. 4, 1969, Ser. No. 881,978

Int. Cl. B65g *57/24*

U.S. Cl. 214—6 FS **3 Claims**



An air-actuated palletizer for cans having a vertically reciprocable platen with vacuum cup for connection with cans on a conveyor carried against a pattern forming bar over which the cans are elevated by said cups and moved to a loading position for lowering said cans onto a pallet supported stack. A system of air-actuated valves controls the movements, including a valve actuated by movement of one of the cans releasably connected with and suspended from one of said cups.

3,662,903

CARRIAGE FOR CARRYING AND VERTICALLY MOVING TUMBLERS OR FRAMES RELATIVE TO A TREATMENT OR PROCESSING LINE

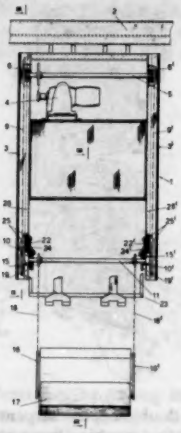
Claudio Mazzone, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, (Turin), Italy

Filed Feb. 24, 1970, Ser. No. 13,609

Claims priority, application Italy, Feb. 26, 1969, 50733 A/69

Int. Cl. B65g *69/00*

U.S. Cl. 214—1 QC **14 Claims**



A carriage for carrying workpieces such as drums, and frames through a treatment or processing line is described. The carriage is capable of lifting and lowering the workpieces at predetermined intervals as determined by a plurality of treatment or processing stations along the line. The carriage is useful in carrying the workpieces along a treatment line, for example electroplating, wherein the workpieces must be introduced into a tank, rotated while in the tank and from which they must be lifted after completion of the treatment accomplished in each tank.

3,662,904

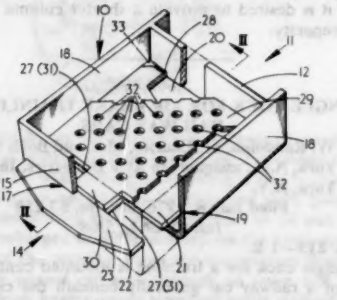
COUNTING DEVICE

Vincent John Tune, 1 Buxton Close, Maidstone, England

Filed Sept. 3, 1970, Ser. No. 69,418

Int. Cl. G07d *9/06*

U.S. Cl. 214-1C **4 Claims**



A unit for counting tablets or other like elements which is in the form of an open box having an intermediate withdrawable floor on which is supported a plate having a predetermined number of holes for accommodating tablets and the back of the box being open at the bottom so that when the holes in the plate are filled with tablets and the withdrawable floor is pulled out the predetermined number of tablets fall to the bottom of the box and can be removed out of the back.

3,662,905

STORAGE PALLETS AND DRIVE MEANS THEREOF

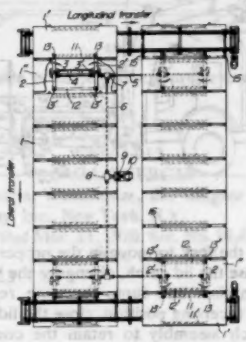
Kaoru Mizuno; Tetsuo Kitamura; Shoichi Nakao; Takenhiko Yasuda; Akio Ueno; Kyunojyo Yoshikawa; Takeo Yuminaka, and Kazuhiro Sakata, all of Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 23, 1967, Ser. No. 625,539

Claims priority, application Japan, Dec. 7, 1966, 41/11477; Oct. 14, 1966, 41/95069; May 24, 1966, 41/48661; 41/48660; May 2, 1966, 41/40456; Jan. 11, 1967, 42/1769; Apr. 19, 1966, 41/24841

Int. Cl. E04h 6/06

U.S. Cl. 214—16.1 CD 3 Claims



A horizontal circulation type of storage equipment having a plurality of horizontal rows of article carrying pallets arranged in a manner to provide a vacancy of pallet at one end of each of the pallet rows so that successive and alternate transfer of pallets can move a desired pallet to a predetermined station. Drive means for successively and alternately transferring the pallets in their longitudinal and lateral directions, plural-storied storage equipment consisting of a stack of the above storage equipments, storage equipment provided with lift means, and coupling means for the pallets are described herein.

3,662,906

CONVEYOR SYSTEMS

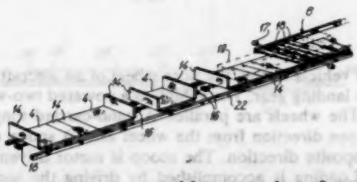
Svend Christensen, Risskov, Denmark, assignor to Crisplant A/S, Risskov, Denmark

Filed Sept. 2, 1970, Ser. No. 68,843

Claims priority, application Great Britain, Sept. 2, 1969, 43,342/69

Int. Cl. B65g 67/12

U.S. Cl. 214—41 10 Claims



A conveyor system comprising a number of carrier vehicles each having a load supporting platform operable to receive articles to be conveyed, driving means for said vehicles, and means for guiding said vehicles along a predetermined track, said track extending past a feeding station and at least one unloading station, said feeding station adjacent said track having transfer means operable to transfer articles to said vehicles during presence of vehicles in said feeding station, said unloading station adjacent said track having means operable to effect unloading of said articles from the vehicles, said vehicles being provided with releasable coupling means operable to couple together two consecutive vehicles in such a manner that the load supporting platforms thereof form a substantially unbroken platform of a length bigger than that of the platform of a single vehicle, detector means being provided adjacent said feeding station for detecting the length of each article transferred to said vehicles, said detector means being operatively connected to actuator means for said coupling means so as to effectively provide coupling together of at least two consecutive vehicles in response to said detector means detecting the length of an articles under transfer from the feeding station to exceed the length of the platform of a single vehicle.

3,662,907

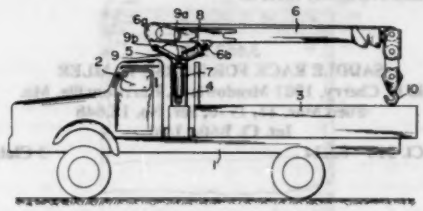
DEVICE FOR ACTUATING A SWINGABLE BOOM

Toshihiro Nakajo, Tokyo, Japan, assignor to Unic Corporation, Tokyo, Japan

Filed Apr. 17, 1970, Ser. No. 29,573

Int. Cl. B60p 1/48

U.S. Cl. 214—77 R 3 Claims



A device for actuating the swingable boom of a truck crane. The boom is swingably supported at the top of a hollow post secured to a crane truck. A pair of series connected hydraulic cylinders are disposed between the boom and the hollow post, while guiding the movement of the hydraulic cylinders by the hollow space of the post. Thereby, when the boom is actuated by the hydraulic cylinders, the hydraulic cylinders are prevented from moving toward a baggage frame of the crane truck and from reducing the effective floor space of the baggage frame.

3,662,908

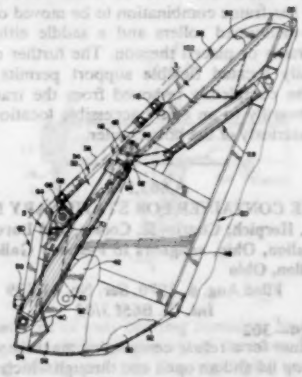
VEHICLE LOADER

Robert A. Boda, Oshkosh, Wis., assignor to Leach Company, Oshkosh, Wis.

Filed June 5, 1970, Ser. No. 43,935

Int. Cl. B65f 3/00

U.S. Cl. 214—83.3 11 Claims



A refuse loader adapted for use with a refuse collection vehicle and including a packer plate movement mechanism

of an improved, simplified construction. The mechanism includes a packer plate which is pivotally mounted on a reciprocable carrier so as to be able to move while extended with the carrier to a position for engaging a load of refuse, then be swung through an arc to collect and compact the refuse and thereafter be moved with the carrier to discharge portion of the loader. The same cycle may thereafter be repeated as desired. The improved design provides, by means of an improved link, cylinder, packer plate, and carrier arrangement, a mechanism having improved flexibility in relation to known mechanisms previously used in counterparts of the loading mechanism of the invention, and also having improved reliability and simplicity. The function previously achieved with four hydraulic cylinders is now accomplished using only two. In addition, the unit has inherent safety features not heretofore available in such units. In addition to providing a novel mechanism and operating cycle, the unit affords a compact design which enables an associated refuse collection vehicle body to be shortened, for increasing the effective load able to be handled by the truck and improving the maneuverability thereof.

3,662,909

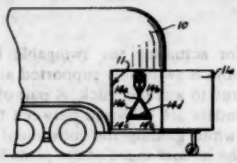
SADDLE RACK FOR HORSE TRAILER

Harold R. Cherry, 1901 Meadowlark, Harrisonville, Mo.

Filed Mar. 11, 1970, Ser. No. 18,648

Int. Cl. B60p *3/00*

U.S. Cl. 214—83.24 **3 Claims**



A saddle rack carrier is mountable in the storage compartment of a horse trailer by fore and aft swingable hinges which support a track structure and includes a combination carrier bar and saddle frame which is selectively and movably mounted thereon. To accomplish a selective movable mount, yoke members are fixedly attached to each end portion of the frame and have roller members thereon which engage with the upper surface of the track structure. A flexible support is removably connected with the track and fixedly attached to the central portion of the carrier bar. The outer yoke is fixedly located by a safety ring. In this manner, the outer yoke is removable from the track thereby permitting the carrier bar-frame combination to be moved outwardly on the above-mentioned rollers and a saddle either removed from the frame or placed thereon. The further detaching of the centrally located flexible support permits the saddle frame to be completely removed from the track or to be moved outwardly to an easily accessible location for a user standing exteriorly of the horse trailer.

3,662,910

REFUSE CONTAINER FOR STATIONARY PACKER

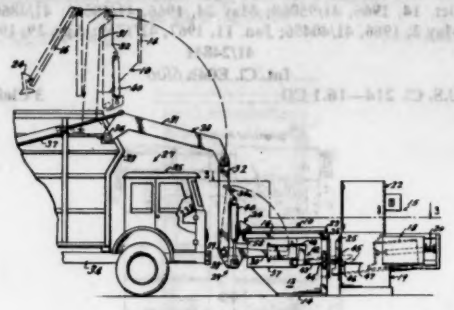
William A. Herpich; Charles R. Cooley, and Loren A. Shoup, all of Galion, Ohio, assignors to Peabody Galion Corporation, Galion, Ohio

Filed Aug. 6, 1970, Ser. No. 61,539

Int. Cl. B65f *3/02*

U.S. Cl. 214—302 **10 Claims**

A container for a refuse compacting machine which has an openable top lid and an open end through which the machine pushes the refuse into the container. The container has sleeves on the outer sides of its end walls in which the fork of a refuse truck can be engaged for lifting ad dumping the container; a catch for the lid which can be both locked and unlocked by vertical movement of the fork and a latch assembly which engages a part of the compacting machine and which retains the container in refuse receiving position adjacent the compacting machine. Without leaving the cab of the truck,



and by causing the fork to move in the proper sequence, the driver can release the lid catch, disengage the latch assembly, pick up the container and dump the same, replace the container in refuse receiving position, close the lid catch, and reengage the latch assembly to retain the container on the compacting machine.

3,662,911

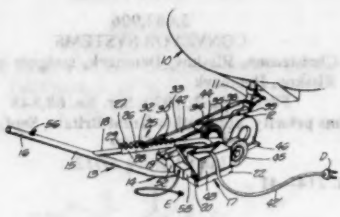
TOWING DEVICE

Donald A. Harman, 41614 - 102nd Street, East Lancaster, Calif.

Filed Mar. 20, 1970, Ser. No. 21,288

Int. Cl. B60p *3/06*

U.S. Cl. 214—334 **3 Claims**



A land vehicle to tow the nose wheel of an aircraft having a tricycle landing gear. The vehicle is a powered two-wheeled vehicle. The wheels are parallel. A hand-carried tongue extends in one direction from the wheel axis. A scoop extends in the opposite direction. The scoop is motor driven by the wheels. Loading is accomplished by driving the scoop underneath the aircraft wheel. An adjustable towline is used for balance during towing.

3,662,912

DRIP TRAY FOR REFRIGERATORS

Jose Luis Rodriguez Calle, Mitarto No. 2, Guipuzcoa, Spain

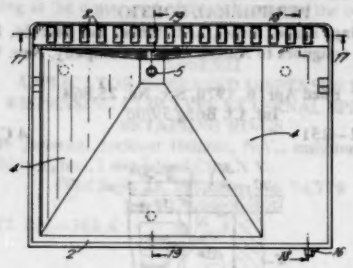
Filed Oct. 30, 1970, Ser. No. 85,656

Int. Cl. B65d *25/18*

U.S. Cl. 220—9 R **5 Claims**

A drip tray for a refrigerator has upper and lower panels with an insulating panel between them. The upper and lower

panels slope towards a water outlet orifice provided in the

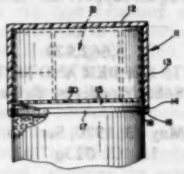


tray. Along a side of the tray there are several apertures for the passage of air.

3,662,913
DUAL OVERCAP

Carmen T. Mascia, Westchester, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Mar. 11, 1970, Ser. No. 18,432
Int. Cl. B65d *1/24, 1/36*
U.S. Cl. 220—23 **5 Claims**



The overcap comprises a receptacle adapted for snap fit over a can bead. The receptacle is provided with a snap-in cover, so held that the latter is retained during application or removal of the overcap.

3,662,914
CAN END WITH REMOVABLE TAB CLOSURE

William J. Slade, Moorestown, N.J., assignor to Campbell Soup Company, Camden, N.J.

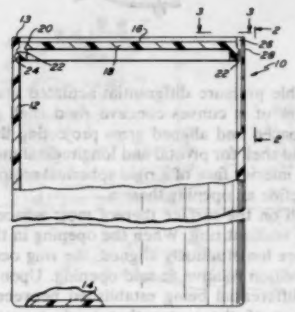
Filed Oct. 26, 1970, Ser. No. 83,805
Int. Cl. B65d *39/00, 41/00, 43/00*
U.S. Cl. 220—24 A **7 Claims**

A can end has a pouring aperture and a smaller venting aperture both of which are covered and sealed by an elongated removable tab having integral rivet portions corresponding to the size and configuration of the apertures in the can and positioned within the apertures. The integral rivet portions are riveted to compress a gasket between the tab and the top of the can but the formation of the rivet is incomplete so that the tab may be manually removed from the can end by pulling the rivet portions of the tab out of engagement with the apertures in the can end. A finger grip is provided on the tab remote from the pouring aperture, and the tab is constructed to bend along a line transverse to and between the rivet portions so that the rivet engaged within the vent aperture is withdrawn from the vent aperture before the other rivet portion is withdrawn from the pouring aperture. A portion of the can end at the side of each aperture closest to the finger grip is weakened by the score lines permitting the can to distend upon upward displacement of the finger grip to reduce the pulling force required to remove the integral rivets from the apertures.

3,662,915
TAMPER PROOF PACKAGE

Howard L. Destler, Jr., Warminster, Pa., assignor to Dougherty Brothers Co., Beuna, N.J.

Filed Oct. 8, 1970, Ser. No. 79,152
Int. Cl. B65d *17/00*
U.S. Cl. 220—27 **5 Claims**

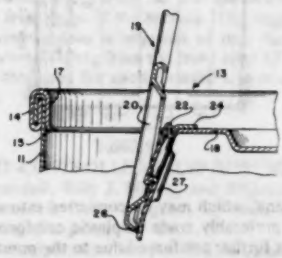


A container structurally interrelated so as to provide telltale evidence if the container contents have been tampered with. A tab defined by a recess on the ID of a container is broken away when entry is made into the container. The container and its cover are made from brittle polymer plastic.

3,662,916
EASY OPENING CONTAINER

Albert J. Holk, Jr., Frankfort, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,645
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **4 Claims**



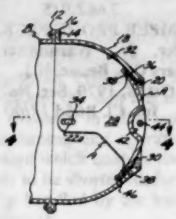
A full panel type of easy opening container having means for increasing the initial opening arc of the score line during upward tilting of the pull tab. The rigidifying means comprises beads arranged to form a rigid panel portion at the rivet so that a bend line occurs behind the rivet upon penetration of the pull tab nose into the container.

3,662,917

PRESSURE DIFFERENTIAL ACTUATED SEALING MEMBER

Derek D. Hardingham, 1030 Crest View Drive, Seal Beach, Calif.

Filed June 15, 1970, Ser. No. 46,335
Int. Cl. A47j 27/08; B65d 43/26
U.S. Cl. 220—55.3 2 Claims



A movable pressure differential actuated sealing member in the form of a convex-concave rigid shell that has two laterally spaced and aligned arms projecting therefrom that support said shell for pivotal and longitudinal movement relative to the interior face of a rigid spherical sector that is truncated to define an opening therein.

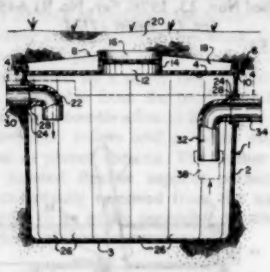
The shell on the surface thereof most adjacent the sector supports a resilient ring. When the opening in the sector and the shell are longitudinally aligned, the ring occupies an encircling position relative to said opening. Upon a substantial pressure differential being established between the interior and exterior of the sector that tends to move the shell towards the sector, the resilient ring is compressed, and the shell acts as a door to seal the opening.

3,662,918

REINFORCED SEPTIC TANK

David D. Crawford, 1601 North Oak Street, and John W. Elvington, 605 Mesquite, both of Mineral Wells, Tex.

Filed Aug. 24, 1970, Ser. No. 66,264
Int. Cl. B65d 87/10
U.S. Cl. 220—85 R 8 Claims



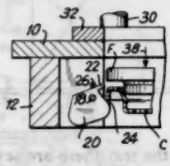
A septic tank, which may be converted into a grease trap. The tank is preferably made of plastic reinforced with fiber glass and it is further reinforced due to the construction. The tank is light weight, therefore easy to install, is durable and resistant to corrosion due to ground moisture, and will not deteriorate because of exposure to acids and alkalies. The cover of the present tank interfits with the tank in fluid tight relation. It is readily converted into a grease trap by the addition of an extension onto the outlet pipe which extends downward into the tank.

3,662,919

METHOD AND APPARATUS FOR BOTTOM DISPENSING STACKED ARTICLES HAVING UNDERCUT PERIPHERAL PORTIONS

Zvi Shmerling, Kiron, Israel, and Robert Lee Merold, Ramsey, N.J., assignors to American Can Company, New York, N.Y.

Filed Apr. 6, 1970, Ser. No. 25,868
Int. Cl. B65g 59/06
U.S. Cl. 221—251 4 Claims



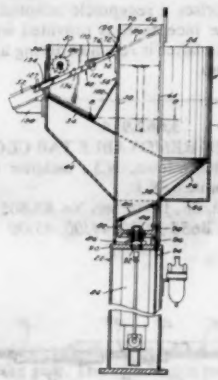
A method of and apparatus for bottom dispensing stacked articles, such as cups or lids, wherein the article stack is supported by fingers having support surfaces engaged with the lowermost article of the stack, the support surfaces projecting into relatively undercut peripheral portions of the article. Subsequent elevation of the stack by manual or mechanical means causes the supporting finger surfaces to retract automatically to permit descent of the stack and withdrawal of the lowermost article. Stack descent effects direct engagement of camming surfaces on the fingers with the articles, causing the supporting surfaces to reengage the next lowermost article and to again support the stack.

3,662,920

PARTS FEEDER AND METHOD

Arnold I. Lubin, 8485 Woodcrest Drive, Apt. 4, Westland, Mich.

Filed May 13, 1970, Ser. No. 36,844
Int. Cl. B23q 7/12
U.S. Cl. 221—162 7 Claims



Disclosed is a method of and apparatus for feeding small parts in a pre-determined orientation from a hopper containing an unoriented mass of the parts wherein the hopper is stationary and has downwardly sloping bottom walls for gravity feeding the parts to the lowest point of the hopper and with an elevator tube extending upwardly through the hopper from such lowest point to the upper end of a downwardly and outwardly sloping parts orienter, and in which the tube opens laterally through a slot into the hopper along one side and opens laterally on the other side at its upper end toward the orienter, and with an elevator reciprocable in the tube and having a sloping parts elevating platform and a gate depending from the platform to close the slot upon ascent of the elevator and with the platform shiftable along the tube from

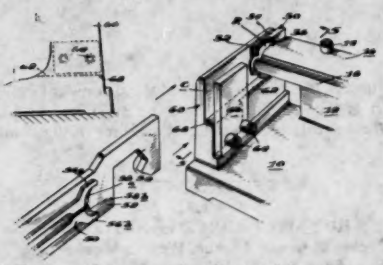
a position at the lowest point of the hopper, where parts gravity flows into the tube above the platform, upwardly to a position for gravity discharging parts through the lateral opening at the upper end of the tube toward the orienter.

3,662,921

APPLICATOR-OPERATED DISPENSER FOR DISPENSING CLIP-TYPE EXTERNAL SPRING RETAINING RINGS

Gustav Janecka, Jackson Heights, N.Y., assignor to Waldes Kohinoor, Inc., Long Island City, N.Y.

Filed Sept. 23, 1970, Ser. No. 74,779
Int. Cl. B65g *59/00*
U.S. Cl. 221—312 A 6 Claims



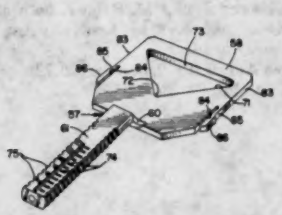
A dispenser for external spring retaining rings, particularly but not exclusively clip-type retaining rings of the form thereof disclosed and claimed in copending Wurzel application Ser. No. 852,866, filed Aug. 25, 1969, now U.S. Pat. No. 3,595,123, dated July 27, 1971, capable of being operated by a leverage-advantage type applicator as disclosed in my concurrently filed application for letters patent thereon entitled "A Hand Applicator for Assembling External Retaining Rings in Their Grooves by Radial Application," Ser. No. 74,780, with "operated" meaning the acts or operations of picking off, one at a time, the endmost ring of a spring-loaded supply thereof maintained in face engagement and in stack or column formation or a magazine rail provided by the dispenser and thereupon of withdrawing said ring for assembly in its groove.

3,662,922

GRANULAR CHEMICAL APPLICATOR WITH SLIDABLE METERING MEANS

Augustyn M. Gesior, Clarendon Hills, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed June 19, 1970, Ser. No. 47,856
Int. Cl. B67d *5/22*
U.S. Cl. 222—46 1 Claim



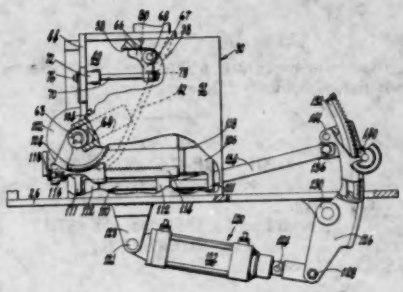
A dispenser including metering mechanism for dispensing granular chemicals and like materials in agricultural operations wherein the dispenser has a concave bottom in which is mounted a vaned wheel for delivering material to a discharge outlet, and a valve is linearly slidable against the bottom and has a metering opening registrable with the outlet for regulating the rate of flow of material therefrom, the valve having an external portion with indicia, and wherein means are provided for adjusting the valve.

3,662,923

FEEDING PARTICULATE MATERIAL

Robert George Spanton; Gordon Cecil John Wakefield; Robert Charles Quarmby, and Terence James Leonard Clarke, all of Leicester, England, assignors to The British United Shoe Machinery Company Limited, Leicester, England

Filed Nov. 27, 1970, Ser. No. 93,217
Claims priority, application Great Britain, Dec. 3, 1969, 58,961/69
Int. Cl. G01f *11/00*
U.S. Cl. 222—55 10 Claims



The invention relates to feeding particulate material, especially a machine for and method of feeding particulate material wherein a conveying surface and an opening from a hopper containing particulate material to be metered are first moved relatively, the conveying surface moving relatively forward, at a comparatively slow speed commensurate with the rate of flow of material from the hopper onto the surface to spread a layer of particulate material on the surface, the layer having a thickness controlled by the spacing of control means from the conveying surface, and then again relatively moved, the conveying surface being moved rearwardly relative the opening and the layer being prevented, or substantially from moving rearwardly so that particulate material falls from the front edge of the surface. The length of stroke of the conveying surface is adjusted so that the amount of particulate material falling from the front edge of the conveying surface is the same for each forward and rearward cycle of the surface.

3,662,924

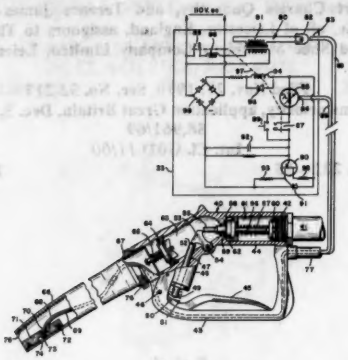
LIGHT-CONTROLLED FLUID DISPENSER

Stanley C. Crandall; Billy J. Harris, and Richard L. Nelson, all of Greensboro, N.C., assignors to Gilbert & Barker Manufacturing Company, New York, N.Y.

Continuation of application Ser. No. 790,963, Jan. 14, 1969, now abandoned. This application Feb. 26, 1971, Ser. No. 119,351
Int. Cl. B67d *5/08*
U.S. Cl. 222—64 11 Claims

A fluid sensing device for controlling the dispensing of a liquid into a container in which a light beam is transmitted from a remote source to a predetermined location of fluid

discharge and the light beam is reflected to a light responsive control circuit during fluid flow whereby upon light beam interruption or modification fluid flow may be terminated or re-initiated, manually or automatically.



3,662,925

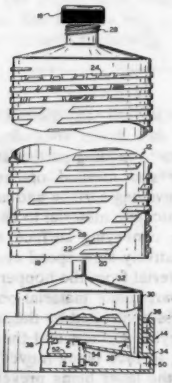
DIMINISHING CONTAINERS

Leland V. Hall, Riddle, Oreg., assignor to Oasis Electronics, Riddle, Oreg.

Filed Dec. 23, 1969, Ser. No. 887,528

Int. Cl. B67b *7/36*

U.S. Cl. 222—80 **1 Claim**



Plastic cylindrical containers having threaded bodies are adapted to be screwed into cupped rams, which carry staples having sharp edges serving to shave the lower edges of the containers. One container has an external thread which is interrupted to form a design and indicia and which forms a ratchet to define an anti-reverse structure with pawl portions of the ram. Another container has an internal buttress thread.

3,662,926

VALVE AND BAG ASSEMBLY FOR PRESSURE DISPENSING

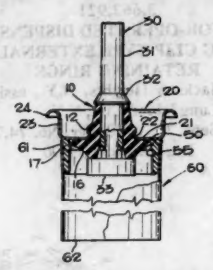
Herbert R. Umstead, Budd Lake, N.J., assignor to Clayton Corporation, St. Louis, Mo.

Filed Jan. 19, 1971, Ser. No. 107,666

Int. Cl. B65d *35/28*

U.S. Cl. 222—95 **8 Claims**

For dispensing from a pressurized container without aeration, a bag for containing a pasty product is suspended beneath a container top by a ring member having a tapered, inward extending rim. The ring member is supported by the flexible outer part of the flange of a conventional elastic seal at whose center is located a conventional valve stem. The tapered rim fits the configuration of the downward deflected outer part of the seal flange, while the radially inner part of the seal flange seals against the undersurface of the container top.



3,662,927

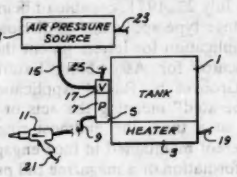
HOT-MELT ADHESIVE SYSTEMS

Eric H. Cocks, 21 Crane Avenue, West Caldwell, N.J.

Filed Jan. 21, 1970, Ser. No. 4,501

Int. Cl. B67d *5/62*

U.S. Cl. 222—146 HE **5 Claims**



An apparatus for applying hot-melt adhesives comprises a heated tank which supplies fluid adhesive by gravity to an air-operated pump for distribution to a hand-held dispensing gun. The gun and pump are energized simultaneously or in such predetermined fashion as to facilitate accurate dispensing of the adhesive.

3,662,928

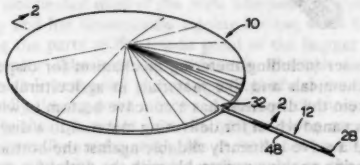
FLUID SAMPLING DEVICE

Louis A. Pogorski, and Ernest M. Reimer, both of Toronto, Ontario, Canada, assignors to Louis August Pogorski, Toronto, Ontario, Canada

Filed Apr. 6, 1970, Ser. No. 25,736

Int. Cl. B65d *37/00*

U.S. Cl. 222—211 **12 Claims**



A device for the collection, storage or transfer of fluids comprising two thin, metallic inherently stable shells each of

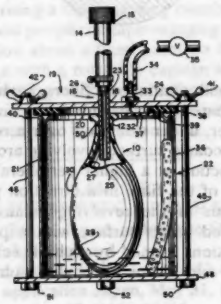
like shallow dome-shape contour joined at their basal abutting edges to define in internal cavity isolated from the atmosphere, at least one of said shells having an inherent spring-like flexibility such that under the application of an externally applied force it is displaceable without rupture from the cavity defining relation of maximum volume to a second stable position of an inverse uniformly dome-shaped contour with the other of said shells in cavity defining relation of minimum volume, and reversely, and passage means integral with at least one of said shells for establishing fluid communication with said internal cavity.

3,662,929

DEVICE FOR DISPLACING A SUBSTANCE IN RESPONSE TO FORCES GENERATED BY A FLUID UNDER PRESSURE

Samuel Francis Sims, 1515 A South Ninth Street, Alhambra, Calif.

Filed June 29, 1970, Ser. No. 50,834
Int. Cl. B67d *5/54*
U.S. Cl. 222—386.5 **3 Claims**



A device for forcing a substance to be displaced from a containing enclosure using the forces generated by a fluid under pressure. The fluid under pressure enters an enclosure, a portion of whose surface is formed by a flexible membrane. The flexible membrane forms a common surface between the enclosure in which the fluid under pressure is held and the containing enclosure in which the substance to be displaced is held so that forces generated on the membrane by the fluid under pressure are applied to the substance to be displaced. As the fluid under pressure flows into the enclosure the membrane deflects and forces the substance to be displaced from the containing enclosure. An embodiment of this invention is disclosed in which the flexible membrane expands within the interior of a rigid container thus forcing the substance within the container to be displaced. Another embodiment of this invention is disclosed in which the fluid under pressure enters a rigid container and causes the flexible membrane within the container to collapse thus forcing the substance to be displaced out of the containing enclosure a portion of whose surface is formed by the flexible membrane.

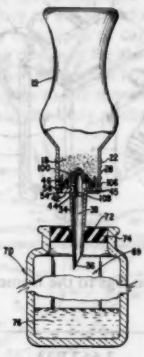
3,662,930

DISPENSER FOR POWDERED MEDICAMENTS

Eugene J. Meierhoefer, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed June 30, 1970, Ser. No. 51,088
Int. Cl. B67d *3/00*
U.S. Cl. 222—564 **6 Claims**

The disclosure is directed to an improvement in a dispensing package for adding a supplemental medicine to a parenteral solution container which is characterized by a plug disposed between the medicament reservoir and the discharge conduit. The plug has a labyrinth through which solid medicament must pass on discharge. The function of the labyrinth is to prevent the additive powder from being



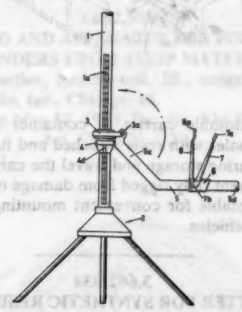
spilled or misdistributed out of the package as the package is being brought into functional engagement with an intravenous solution bottle.

3,662,931

HEMLINE GAUGE

Eric Richard Arthur, 94 Boston Road, Hayes, and Oliver Robert Clemesha, 13 Eastdown Park, London, both of England

Filed Oct. 9, 1970, Ser. No. 79,486
Claims priority, application Great Britain, Oct. 10, 1969, 49,905/69
Int. Cl. A41h *31/00, 9/00*
U.S. Cl. 223—1.1 **1 Claim**



A hemline gauge adapted to be fitted to a center tube of a dress form which can be set at a required height on said tube and is rotatable about the axis thereof, and fitted with elements which can be gripped about a hem to form vertical pleats through which pins can be passed to maintain the formed hem when the elements are opened apart and released.

3,662,932

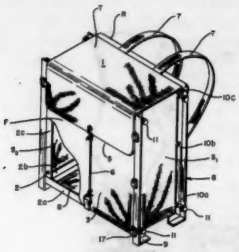
PACK CONVERTIBLE TO STOOL

Ralph C. Kerschner, Star Route, Mohrsville, Pa.

Filed June 1, 1970, Ser. No. 41,964
Int. Cl. A45f *4/02*
U.S. Cl. 224—9 **7 Claims**

A back-carried pack convertible into a four-legged stool includes a nonrigid sack element supported by a rigid frame. A cushioned surface is disposed on one side of the pack unit.

Stool leg members are detachably mounted on opposed sides of the pack unit and are secured by fastening elements that



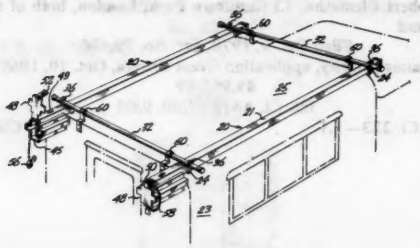
also serve to secure the legs to the frame when the legs are in an extended position.

3,662,933

CARRIER FOR FISHING POLES AND REELS READY TO USE

John Michal, P. O. Box 7, South Prairie, Wash.

Filed June 3, 1970, Ser. No. 43,025
Int. Cl. B60r *9/04*
U.S. Cl. 224—42.1 E 1 Claim



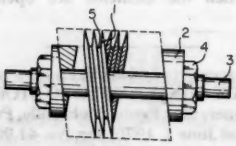
A fully enclosable carrier or container receives one or more fishing poles with reels attached and fully rigged ready for fishing. During storage and travel the carrier protects the fishing equipment fully rigged from damage or theft. Also the carrier is adaptable for convenient mounting anywhere and especially to vehicles.

3,662,934

SPLITTER FOR SYNTHETIC RESIN FILM

Takasi Nara, and Isao Nakao, both of Nara-shi, Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 29, 1970, Ser. No. 6,734
Claims priority, application Japan, Feb. 1, 1969, 44/8846
Int. Cl. B26d *1/28*
U.S. Cl. 225—97 4 Claims



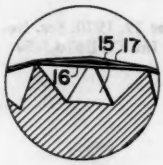
A novel splitter to be used to split synthetic resin film into a network of continuous fibrous strands. The splitter comprises a shaft, a plurality of blade disks, and a pair of supports each having on one side of it a protuberance. The blade disks fitted on the shaft are pressed by the supports and are assembled as a whole in a helical form along inclined planes of the protuberances.

3,662,935

APPARATUS FOR FIBRILLATING UNIAXIALLY ORIENTED FILM

Masahide Yazawa; Tokio Okada, Tokyo, and Kazue Yamano, Urawashi, all of Japan, assignors to Polymer Processing Research Institute Ltd., Tokyo, Japan

Filed Nov. 3, 1969, Ser. No. 873,451
Claims priority, application Japan, Nov. 18, 1968, 43/84655
Int. Cl. B26f *3/02*
U.S. Cl. 225—97 1 Claim



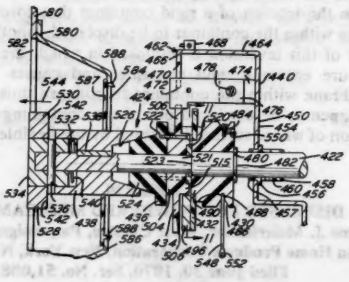
A web of small continuous fibers having a reticulated structure is prepared by slide-rubbing a uniaxially oriented film of a polymer, under a tension over a revolving bar like means having a coarse surface revolving around an axis in a longitudinal direction at a higher peripheral speed than the travelling speed of the film, in a direction perpendicular to the revolving axis of the revolving means. The revolving means is provided on its surface with a plurality of small roof-type projections formed by multiple screw threads having sharp crests and scraped grooves, intersecting with the said threads.

3,662,936

FILM ADVANCE MECHANISM FOR COMBINATION VISUAL AND SOUND APPARATUS

Donald A. Youngblood, Chalfont, Pa., assignor to Optisonics Corporation, Montgomeryville, Pa.

Original application June 14, 1968, Ser. No. 739,909, now abandoned , which is a continuation of application Ser. No. 535,149, Mar. 17, 1966, now abandoned. Divided and this application Apr. 6, 1970, Ser. No. 31,072
Int. Cl. G03b *1/24*
U.S. Cl. 226—51 6 Claims



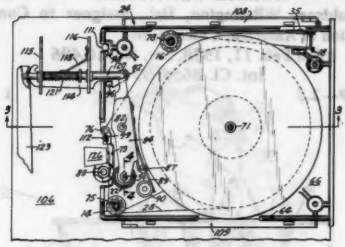
A driving mechanism is operatively connected to a sprocket wheel for rotating the wheel and advancing the frames of a film. An adjusting knob is further provided, which enables manual rotation of the sprocket for fine adjustment of the frame location.

3,662,937

MAGNETIC TAPE PRESSURE ROLLER

Maynard P. Borman, Falcon Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 6, 1970, Ser. No. 17,218
Int. Cl. B65h *17/20*
U.S. Cl. 226—89 4 Claims



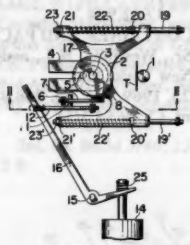
A magnetic tape cartridge including a self-aligning pressure roller comprising a tape engaging member formed with a resilient cylindrical peripheral tape engaging surface and supported for rotation about a fixed point on its axis to permit the roller to align with a rotatable capstan shaft in a recording and/or reproducing machine to uniformly press the length of magnetic tape in the cartridge the peripheral tape engaging surface between, and the capstan shaft.

3,662,938

DEVICE FOR MOVING A PINCH ROLLER

Yukio Hagiwara, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed June 1, 1970, Ser. No. 42,443
Claims priority, application Japan, May 31, 1969, 44/50087
Int. Cl. G11b *15/66*
U.S. Cl. 226—90 4 Claims



A device for pressing a capstan against a pinch roller in a magnetic tape recorder/reproducer perpendicularly elevates a supporting shaft of the pinch roller parallel with the capstan by a lever which converts the movement of a plunger to an elevational movement. Simultaneously the supporting shaft of the pinch roller is moved horizontally into parallel contact with the capstan by pressing the supporting shaft or bearing of the supporting shaft by movement of the same lever.

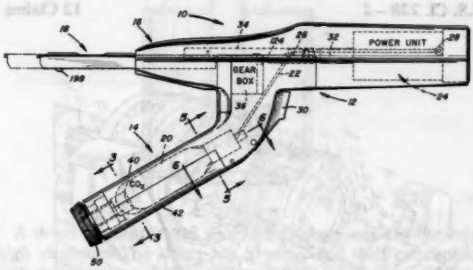
3,662,939

SURGICAL STAPLER FOR SKIN AND FASCIA

Graham W. Bryan, Ridgefield, Conn., assignor to United States Surgical Corporation, Baltimore, Md.

Filed Feb. 26, 1970, Ser. No. 14,614
Int. Cl. B25c *5/02*
U.S. Cl. 227—19 38 Claims

An instrument for applying surgical staples to effect the joining of disunited skin or fascia. The instrument of the present invention is powered by a gas under pressure originating from a gas filled tank, positioned within a housing and adapted to ensure that the introduction of the tank and removal thereof may be easily and quietly accomplished without danger of injury to the operator. The surgical staples are carried in one of two types of cartridge assemblies, the first and smaller being designed for the application of staples to external skin and the second and larger being designed for the application of staples to the more tender internal fascia. The cartridge is held in the body of the instrument by means



of a spring which greatly facilitates the introduction of the cartridge. The instrument is further provided with means for preventing more than one driving operation per trigger activation, means for returning the staple-driving mechanisms to their pre-stapling positions, and a novel power unit.

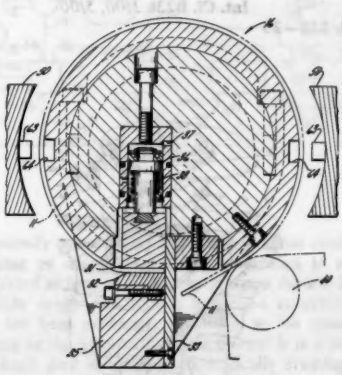
Staple cartridges are also disclosed which ensure proper initial phasing between staple-advancing screws, proper alignment of the screws before insertion into the instrument, and means for preventing accidental ejection of staples during transit.

3,662,940

METHOD AND APPARATUS FOR FORMING CYLINDERS FROM STRIP MATERIAL

Christian H. Stettler, Northbrook, Ill., assignor to Grotnes Machine Works, Inc., Chicago, Ill.

Filed May 13, 1969, Ser. No. 824,206
Int. Cl. B23k *1/20*
U.S. Cl. 228—15 9 Claims



A cylinder-forming method and apparatus is disclosed in which a pre-cut blank of strip material is positioned against a locating abutment and clamped within a rotatable mandrel. As the mandrel is rotated, first and second guide means form the blank to the periphery of the mandrel with flattened end portions being formed on the blank adjacent an end gap.

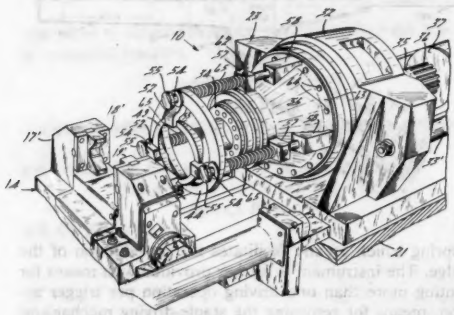
Gripping means seize the blank before unclamping the mandrel, and thereafter transfer the formed blank with its gap in a known predetermined position into the jaws of an electric flash welder wherein the ends of the blank are joined by welding.

3,662,941

APPARATUS FOR REMOVING A WELD UPSET

Arthur Gage, Warren, Mich., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed June 18, 1970, Ser. No. 47,289
Int. Cl. B23k *27/00*
U.S. Cl. 228—2 **12 Claims**



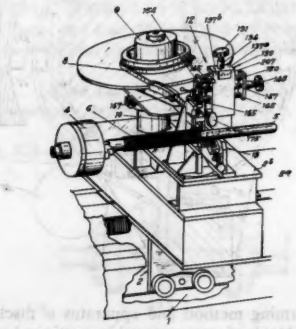
A method and apparatus for automatically removing a weld upset formed between a pair of coaxial workpieces butt welded into an integral article by friction welding or the like. The method and apparatus include a shearing device positioned closely adjacent the abutting surfaces of the workpieces during welding and automatically drawn through the weld upset upon completion of welding to remove the upset.

3,662,942

APPARATUS FOR THE MANUFACTURE OF GILLED TUBES

Edmond Pignal, Thonon-les-Bains, France, assignor to Societe des Fabrications Biraghi-Entrepose, Paris, France

Filed Oct. 23, 1968, Ser. No. 769,824
Claims priority, application France, Oct. 23, 1967, 125455
Int. Cl. B23k *1/00, 5/00*
U.S. Cl. 228—25 **19 Claims**



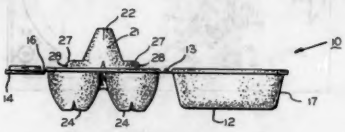
A machine for winding and welding a metal strip around a sealed exchanger tube to form a helical fin, using a welding electrode positioned in the angle between the strip and the tube surface. The tube is rotated while the strip is applied, the strip and electrode being supported on a longitudinally movable carriage. The support for the welding electrode is adjustable vertically, horizontally parallel to the axis of the tube, and also lengthwise along the axis of a sleeve pivotally attached to the support on a horizontal adjusting axis.

3,662,943

MOLDED CONTAINER

David Donaldson, Wilmington, Del., assignor to Container Corporation of America, Chicago, Ill.

Filed Feb. 11, 1970, Ser. No. 10,406
Int. Cl. B65d *1/36*
U.S. Cl. 229—2.5 **1 Claim**



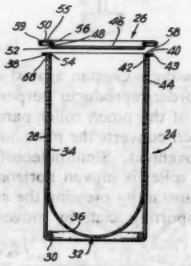
A molded container, particularly for the packaging of frangible articles, such as eggs. The container is characterized by a tray having a plurality of cup-shaped cells formed therein, each receiving one of a number of similar articles, which may vary slightly in size and contour, but each having a transverse cross-section which is essentially circular. Contiguous ones of the cells are separated by a post having essentially vertical webs extending transversely of the long dimension of the carton and outward of the longitudinal planes connecting the center lines of the cells. These webs effectively separate the eggs at their greatest dimension, and they fair downward into generally horizontal webs giving the loaded carton good beam strength longitudinally thereof. Generally horizontally extending webs are provided between the posts and provide good beam strength to the loaded carton in directions transversely thereof.

3,662,944

COMPOSITE CONTAINER AND PACKAGE

Richard Leo Joosten, Sr., Westfield, N.J., assignor to American Can Company, New York, N.Y.

Filed Oct. 23, 1969, Ser. No. 868,880
Int. Cl. B65d *5/56*
U.S. Cl. 229—14 B **1 Claim**



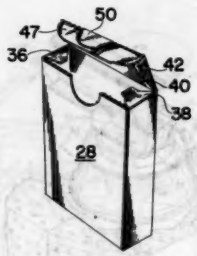
A composite container that may be used for packaging a fluent product, such as a carbonated beverage, has a rigid outer tube, which may be made of fiber, firmly supporting a plastic cup inserted therein and a metal end closure wherein the fiber tube, cup and metal closure are seamed together. An annular flange on the metal closure overlies an annular flange on the plastic cup and is interfolded therewith to form a seam which seals the metal closure to the fiber tube.

3,662,945

CARTON END CLOSURE

Thomas W. Foster, Palo Alto, and George Schafer, Santa Cruz, both of Calif., assignors to Fibreboard Corporation, San Francisco, Calif.

Filed Aug. 3, 1970, Ser. No. 60,341
Int. Cl. B65d 5/02
U.S. Cl. 229—38 17 Claims



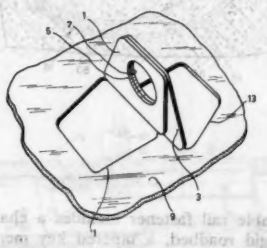
An end closure for a carton comprises adhesively treated major flaps and minor flaps hingedly connected to side and end walls of the carton, respectively. The inner major flap has cutouts formed at the ends thereof to at least substantially accommodate the minor flaps in substantial coplanar relationship therewith when the flaps are folded and sealed together. The outer major flap is adhesively secured over the other flaps and releasably attached to the carton by suitably arranged perforated tear lines to provide an easy opening feature on the carton. A tuck tab is hingedly connected to a free end of the inner major flap to provide means for fully reclosing the carton.

3,662,946

PACKAGE WITH CARRYING HANDLE

Jan Philippus Cornelis Marinissen, and Frederik Alexander Nicolaas Gerardus Arnold, both of Groningen, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,647
Claims priority, application Netherlands, May 3, 1969, 6906798
Int. Cl. B65d 5/46, 25/22
U.S. Cl. 229—52 B 5 Claims



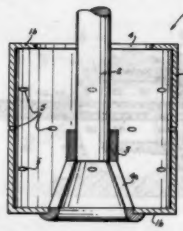
A package with a carrying handle in which lugs are provided in one of the side walls of the package. The lugs are cut out and can be folded out of the plane of the wall about a base to a position at right angles to the plane and in the folded position form a handle. The bases are parallel to each other and are offset with respect to each other in the longitudinal direction.

3,662,947

CENTRIFUGE DRUM WITH DISCHARGE OPENINGS

Kurt Pause, Zedernstrasse 13, Grevenbroich, Germany

Filed Mar. 27, 1970, Ser. No. 23,337
Claims priority, application Germany, Feb. 27, 1970, P 19 16 280.2
Int. Cl. B04b 11/00
U.S. Cl. 233—47 R 5 Claims



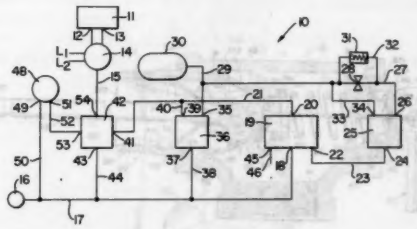
A drum for centrifuges processing substances of relatively high viscosity. The drum has a peripheral wall concentric with its axis of rotation and opposite axial end walls. Outlets are provided in the region of the opposite axial end walls. A plurality of outlet openings are provided in the peripheral wall and each of these has the configuration of a geometric ellipse with the longer axis of the ellipse being normal to the axis of rotation of the drum. A method of making such a drum is disclosed also.

3,662,948

CONTROL SYSTEM AND METHOD FOR OPERATING HEAT EXCHANGER MEANS AND THE LIKE

Louis M. Puster, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 21, 1970, Ser. No. 4,616
Int. Cl. F23n 5/20; G05d 23/00
U.S. Cl. 236—46 27 Claims



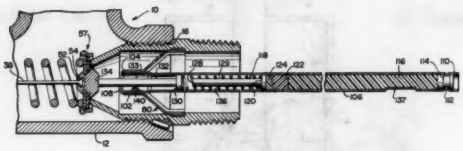
A pneumatically operated actuator having a first condition for maintaining an on-off heat exchanger means in an off condition thereof as long as a pneumatic signal thereto is in a first magnitude range and having a second condition for maintaining the heat exchanger means in an on condition thereof as long as the pneumatic signal thereto is in a second magnitude range, and means for automatically creating and directing to the actuator a pneumatic signal that varies in magnitude over each predetermined time period in a repeating cycle of said time periods so that the first condition and second condition of the actuator will be both variable in relation to each other from approximately 0 to 100 percent of the time in each time period depending upon the magnitude range of the pneumatic signal in each time period.

3,662,949

PRESSURE TEMPERATURE RELIEF VALVE

Harold A. McIntosh, South Pasadena; Theodore J. Dykzeul, Rolling Hills; Gordon K. Slocum, Downey; William D. Rattan, Paramount, and Donald K. Murrell, La Mirada, all of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 6, 1970, Ser. No. 61,557
Int. Cl. G05d 27/00, 23/275
U.S. Cl. 236—92 25 Claims



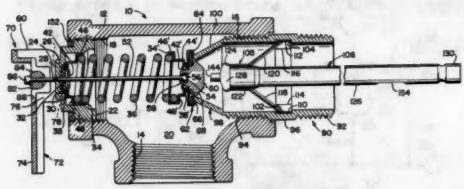
A relief valve including a T-shaped casing having a first port with an insert member secured therein having a conical wall forming a valve seat in a chamber communicating with the first port and a second outlet port, a valve member cooperating with the valve seat and loosely attached with a valve stem extending through a third port axially aligned with the first port, a thermostat assembly, and a retainer for holding the thermostat assembly and including clips engageable with a register groove and shoulder in the insert member.

3,662,950

PRESSURE AND TEMPERATURE RELIEF VALVE

Harold A. McIntosh, 517 Floral Park Terrace, South Pasadena, Calif.; Gordon K. Slocum, 7733 Corey Street, Downey, Calif., and William D. Rattan, 14124 Oriza BA, Paramount, Calif.

Filed Aug. 6, 1970, Ser. No. 61,577
Int. Cl. G05d 27/00
U.S. Cl. 236—92 9 Claims



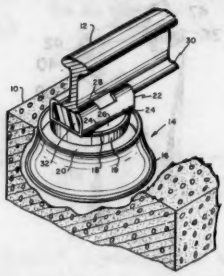
A pressure and temperature relief valve including a T-shaped casing having an inlet port with an insert member secured therein having a conical wall forming a valve seat in a chamber communicating with the inlet port and an outlet port, a valve member cooperating with the valve seat and loosely attached with a valve stem extending through another port axially aligned with the inlet port, a bias spring mounted in compression between first and second retaining cups with the first retaining cup engaging an adjustment plug in the other port and the second retaining cup engaging the valve member, and a ball and swivel lever mechanism engaging the valve stem and the adjustment plug to permit manual opening of the pressure and temperature relief valve.

3,662,951

ADJUSTABLE RAIL FASTENER WITH MELTABLE FILLER

Webster D. Smith, Lomita, and William I. Berks, Manhattan Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed July 28, 1970, Ser. No. 58,849
Int. Cl. E01b 9/66
U.S. Cl. 238—281 10 Claims



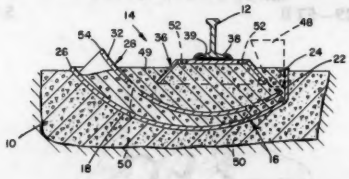
An easily adjustable and readjustable rail support includes two annularly spaced pot-like members that are separated by a readily meltable solid filler material. The outer member is embedded in a concrete or other rigid roadbed. The rim of the inner member supports a channel element which clamps the rail.

3,662,952

ADJUSTABLE RAIL FASTENER DESIGN WITH TAPERED KEY AND CHANNEL MEMBERS

William I. Berks, Manhattan Beach, and Webster D. Smith, Lomita, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 9, 1970, Ser. No. 79,438
Int. Cl. E01b 21/00, 9/02
U.S. Cl. 238—310 3 Claims

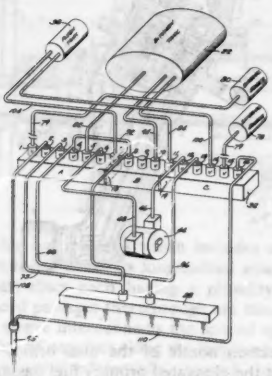


A readjustable rail fastener includes a channel member fixed in a rigid roadbed, a tapered key member inserted within the channel member, and a rail support member positioned above the key member. The rail is clamped to the rail support member, and after it is positioned in its proper location by means of a jig, it is fixed in position by concrete poured between the three members. The rail is readily relocated by breaking the key member loose, knocking away the old potting concrete, replacing the key member, positioning the rail in its new location, and pouring fresh potting concrete.

3,662,953
BITUMEN SPRAY AND TRANSFER WITH MASTER CONTROL

John M. Wiens, Wales, Wis., assignor to Wales Metal Products, Inc., Wales, Wis.

Filed July 30, 1970, Ser. No. 59,626
Int. Cl. B05b *15/02*
U.S. Cl. 239—112 12 Claims

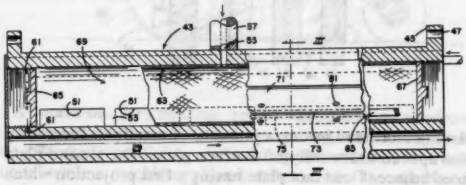


A generally conventional tank truck with heater and spray bar is equipped with valve manifolds and valves and a flush tank and external coupling connections and has a master control with valve actuating means which are preferably operated in desired bitumen circuit combinations by fluid pressure to perform a variety of operations other than merely spraying bitumen through the spray bar onto a highway.

3,662,954
SHEET MATERIAL HEATING AND HUMIDIFYING DEVICE

Carl R. Pepmeier, Fredericksburg, Va., assignor to FMC Corporation, Philadelphia, Pa.

Original application June 5, 1969, Ser. No. 830,667, now Patent No. 3,591,908. Divided and this application Jan. 19, 1971, Ser. No. 107,686
Int. Cl. B05b *1/24*
U.S. Cl. 239—134 4 Claims

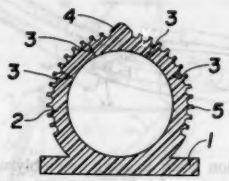


A steam chest for use in a laminating apparatus for concomitantly heating and humidifying traveling sheet materials immediately prior to laminating of the same.

3,662,955
LENGTH OF WATERING HOSE FOR CULTIVATING PLANTS

Michinobu Takanashi, 5, 9-banchi, 2-chome Sakae-cho, Higashi, Murayama-shi, Tokyo-to, Japan

Filed Mar. 10, 1970, Ser. No. 18,163
Claims priority, application Japan, Nov. 18, 1969, 44/108921; June 6, 1969, 44/52427
Int. Cl. A01g *27/00*
U.S. Cl. 239—145 2 Claims

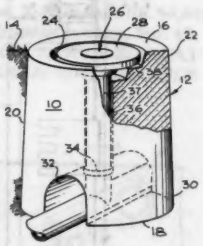


A length of hose made of a flexible and weather-proof material having high elasticity e.g., a suitable synthetic resin, or plastics or a co-polymer of ethylene vinyl acetate resin, having a plurality of incisions formed in the wall of the hose from inside to outside at proper portion thereof, and comprising a strengthening means such as a longitudinal cross shaped press-back means made of polyethylene or a co-polymer of acrylo nitrile ethylene or ethylene vinyl acetate inserted into the hose; the hose may instead be provided with longitudinal stiffening ribs on the surface thereof; longer lengths of the hose may be formed by joining shorter lengths of the hose by means of adaptors.

3,662,956
SPRINKLER PROTECTOR

Ernest L. Hedman, 3414 Culver Street, Bakersfield, Calif.

Filed Aug. 6, 1970, Ser. No. 61,728
Int. Cl. B05b *15/06*
U.S. Cl. 239—201 10 Claims



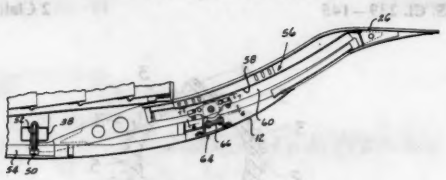
An improved sprinkler protector comprises a rigid, self-supporting body having an upper recess to wholly enclose a sprinkler head, a transverse lower aperture to enclose a sprinkler connector and a small diameter central standpipe passageway interconnecting the recess and aperture. Detent means are provided in the area of the recess to prevent substantial depression of the sprinkler head and rupture of the sprinkler system adjacent the connector. Reinforcing means and anchoring means for the protector body may also be provided.

3,662,957

LOW FRICTION TRACK BEARING ASSEMBLY

James C. Pinto, Hartford, and Ransom S. Thompson, Middle Haddam, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 28, 1970, Ser. No. 84,719
Int. Cl. B64c *15/06*
U.S. Cl. 239—265.39 9 Claims



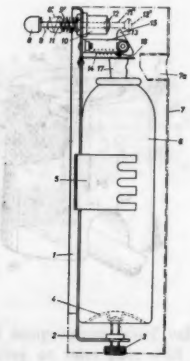
A low friction track bearing assembly which is supported on a stationary member such as a jet engine housing for movement around an axis which is perpendicular to the axis of rotation of the first bearings, which are adapted to engage the cam track base of a guide channel in a member such as an iris nozzle section driven in a linear direction through a pivotal connection constraining the member to move around an axis perpendicular to the direction of drive, and parallel to the axes of bearings offset from the first bearings and adapted to engage the straight sides of the channel to permit the member to be driven in the desired linear direction without undue resistance owing to misalignment between the bearing assembly and the channel.

3,662,958

SPRAYING DEVICE OF AEROSOL CONTAINED IN A REMOVABLE TANK

Paul German, 71 Chemin du Levant, 1006 Lausanne, Switzerland

Filed July 21, 1970, Ser. No. 56,800
Claims priority, application Switzerland, July 15, 1969, 11.423/69
Int. Cl. A62c *31/28*; B05b *15/00*; B62d *137/50*
U.S. Cl. 239—274 3 Claims



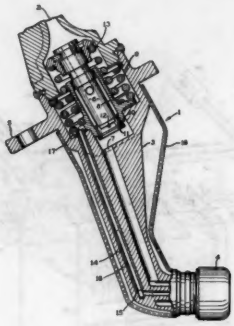
The device provides means for actuating an aerosol spray tank removably mounted on a door, door frame or wall of a bathroom, for example, when the door is shut. The actuating means comprises a rotatable cam member which is urged against the valve of the aerosol spray tank to open the same by a spring controlled plunger. The cam member and plunger are supported on a mounting plate which includes means for supporting the aerosol spray tank and adjusting the position thereof.

3,662,959

FUEL INJECTION NOZZLE

Harry Sample, Jr., Novelty, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Aug. 7, 1970, Ser. No. 61,969
Int. Cl. B05b *1/30*
U.S. Cl. 239—533 5 Claims



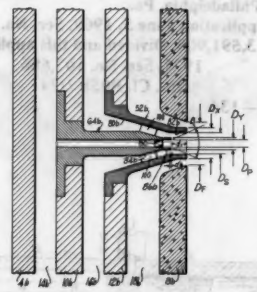
A fuel injection nozzle of the dual orifice type characterized in that the elongated primary fuel passage in the nozzle housing is constituted by a length of tube which is thermally isolated from the housing whereby the flow of fuel through the tube maintains the interior wall thereof at a temperature below that at which carbonizing of the fuel would occur.

3,662,960

INJECTOR HEAD

James P. Mitchell, and Bruce T. Brown, both of North Palm Beach, Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Nov. 21, 1966, Ser. No. 596,393
Int. Cl. B05b *7/10*
U.S. Cl. 239—400 13 Claims



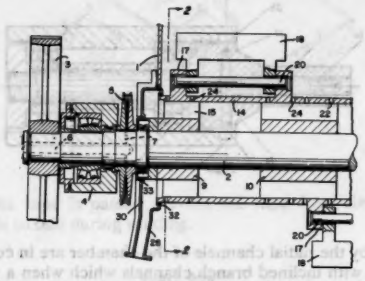
An injector head having a plurality of manifolds formed by plates spaced rearwardly of the face plate. The second plate spaced adjacent said fact plate having a first projection which extends into an opening through the face plate. The third plate positioned rearwardly of said second plate having a second projection which extends into an opening which passes through the first projection of said second plate. An opening passes through said second projection. A back plate is located behind the third plate. Said projections having tapered sections to provide for a desired pressure drop.

3,662,961

BREAKER FOR HOT MATERIAL

Paul Walkowiak, Hamburg, Germany, assignor to Claudius Peters Aktiengesellschaft

Filed Jan. 6, 1971, Ser. No. 104,375
Claims priority, application Germany, Jan. 31, 1970, P 20 04 385.0
Int. Cl. B02c *13/04, 13/288*
U.S. Cl. 241—56 5 Claims



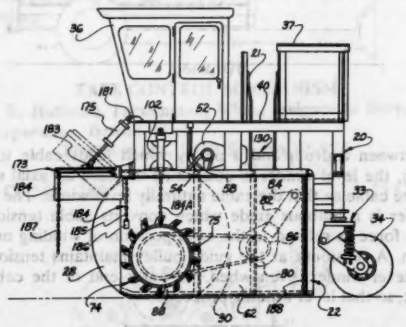
A breaker for hot material which includes a main shaft mounted for rotation about its longitudinal axis. A plurality of spaced apart discs each having a plurality of circumferentially spaced passages therethrough are mounted on the main shaft. A sleeve interconnects the spaced apart discs to define a plurality of passages along the length of the breaker. A plurality of circumferentially spaced hammers are mounted on the breaker externally of the sleeve. Cooling fluid such as air is supplied to each of the passages. Openings in the sleeve discharge cooling fluid from the passages to the area of the hammers. The main shaft is mounted in bearings and a fan arrangements cools these bearings.

3,662,962

MACHINE FOR TREATING REFUSE

Herbert T. Cobey, Galion, Ohio, assignor to Imco, Inc., Crestline, Ohio

Filed Mar. 13, 1969, Ser. No. 806,864
Int. Cl. B02c *19/12*; A01d *57/30*
U.S. Cl. 241—101 M 9 Claims



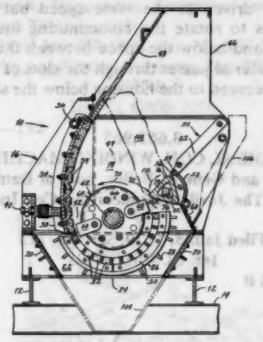
A machine for treating refuse disposed in windrows characterized by a longitudinally extending tunnel and means for effectively confining and treating the refuse within said tunnel while a machine progresses thereover. The machine is further characterized by a main frame and an auxiliary frame supported by the main frame and defining an open ended tunnel. A rotary member is extended transversely of the tunnel for impacting refuse against the top wall of the tunnel. The machine is further characterized by a forwardly extending guide means mounted on said main frame adjacent the top of the tunnel with said guide means being adjustable with respect to its angle of inclination so as to most effectively treat windows of refuse of various heights.

3,662,963

ROCK CRUSHER

Orly Bob McClure, 25 Ellsworth Lane, Ladue, Mo.

Filed June 24, 1970, Ser. No. 49,274
Int. Cl. B02c *13/286, 23/02*
U.S. Cl. 241—186 R 26 Claims



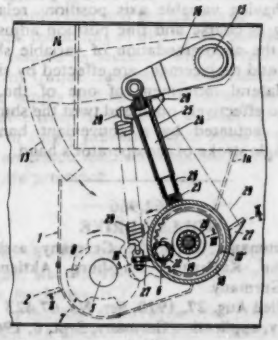
This invention is an improvement in a rock crusher having a crushing chamber with an opening therein, a rotor rotatably mounted in the chamber, hammers carried adjacent the outer radial edge of the rotor, and a feeder chute having its lower end adjacent the opening. The improvement includes an elongated member rotatably mounted within the chamber between the lower end of the chute and the hammer tip circles defined by the hammers as the rotor rotates. The elongated member has a polygonal cross-sectional configuration which is preferably triangular. It is adapted to be rotated selectively for dislodging rocks which become jammed in the chute.

3,662,964

COMMINUTING MACHINE

Kurt Rossler, Belm, Germany, assignor to Bohmter Maschinenfabrik GmbH & Co. K G., Brockstrasse, Bohmte Kreis Osnabruck, Germany

Filed Dec. 2, 1970, Ser. No. 94,418
Claims priority, application Germany, Dec. 10, 1969, P 19 61 820.3; Oct. 7, 1970, P 20 49 124.1
Int. Cl. B02c *7/04, 18/40, 13/20*
U.S. Cl. 241—222 24 Claims



A comminuting machine for metallic, plastic, vitreous, textile, ligneous or other scrap has a pair of horizontal shafts

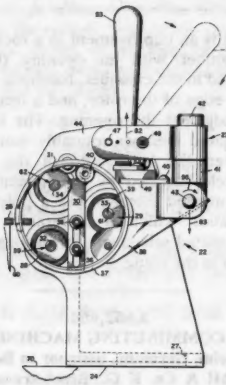
mounted in a housing below a material-admitting inlet and carrying stacks of ring-shaped frustoconical comminuting members provided with alternating tooth spaces and teeth which entrain and fragmentize the material during passage between the shafts. The larger diameter ends of the comminuting members have polished end faces surrounded by cutting edges, and the comminuting members of one of the stacks are inverted with reference to comminuting members of the other stack. The cutting edges of comminuting members of one of the stacks slightly overlap the cutting edges on comminuting members of the other stack. The teeth of comminuting members in each stack form one or more helices. The shafts are driven at the same speed but in opposite directions so as to rotate the comminuting members from above through and below the space between the shafts. The comminuted material passes through the slots of a removable grate which is secured to the housing below the shafts.

3,662,965

TOROIDAL COIL WINDING MACHINE

Vilmos Havasi, and Gene R. Bailey, both of Danbury, Conn., assignors to The Jovil Manufacturing Co., Inc., Danbury, Conn.

Filed Jan. 5, 1970, Ser. No. 713
Int. Cl. H01f *41/08*
U.S. Cl. 242—4 B **11 Claims**



A toroidal coil winding machine comprising a head assembly constructed to support and rotate about its own axis a ring-shaped, wire-carrying shuttle interlinked with a core, which can readily be adjusted to accommodate a large range of shuttle diameters and which provides for rapid removal and replacement of shuttles. The ring-shaped, wire-carrying shuttle is driven by means of three supporting sheaves, two of said sheaves having variable axis positions relative to the third, resulting in coarse and fine position adjustments and providing for the accommodation of variable shuttle sizes. Core removal and replacement are effected by simultaneous upward and lateral movement of one of the supporting sheaves so as to effectively open and twist the shuttle for easy core removal, actuated by a convenient handle readily moved by a single stroke of the operator's hand.

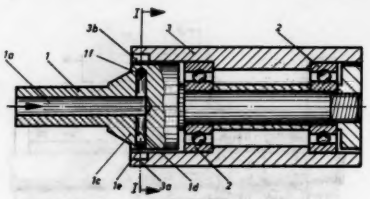
3,662,966

ROLLER DRIVE

Karl-Heinz Baumann, Karlsruhe, Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Karlsruhe, Germany

Filed Aug. 27, 1970, Ser. No. 67,423
Claims priority, application Germany, Sept. 6, 1969, G 69 35 171.9
Int. Cl. B65h *51/00*
U.S. Cl. 242—47.01 **1 Claim**

A thread transfer roller used in chemistry or textile fiber machines is provided on the inner circumference of its tubular roller body with a plurality uniformly circumferentially spaced pockets of uniform size. The stationary spindle on which said tubular body is rotatably supported is provided with an enlargement having therein radial channels or a chamber connected with an axial channel in the spindle,



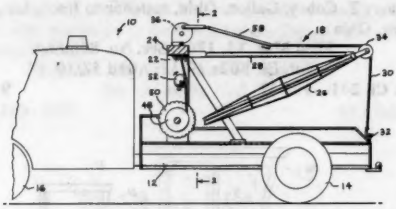
whereby the radial channels of the chamber are in communication with inclined branch channels which when a pressure medium, such as compressed air, is introduced from an exterior source into said channels will be discharged into said pockets and cause said tubular roller body to rotate.

3,662,967

LEVEL WINDER AND TENSIONER

Charles P. Nowell, 7305 El, Buena Park, Calif., and Aubry S. Nowell, 8320 Felicidad, Anaheim, Calif.

Filed July 1, 1970, Ser. No. 51,510
Int. Cl. B65h *75/00*
U.S. Cl. 242—54 **8 Claims**



Between a drum and a pulley which feeds cable to the drum, the level winder is positioned to place an axial stress on the cable so that the cable naturally level-winds. The level winder is a bulbous guide which converts cable tension to axial force as related to the axial position of winding on the drum. A tensioner at the guide pulley maintains tension on the level winder, even when the outer end of the cable is slack, so that level winding proceeds.

3,662,968

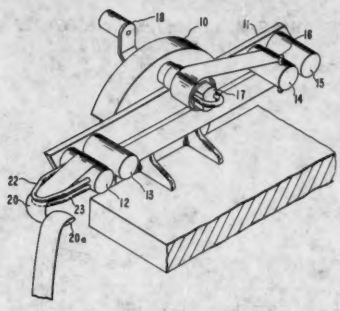
TAPE GUIDE FOR WINDING MACHINES

Gunnar Wennerberg, 1641 Poppy Way, San Jose, Calif.

Filed Apr. 1, 1970, Ser. No. 24,595
Int. Cl. B65h *27/00*
U.S. Cl. 242—76 **7 Claims**

A device for use in removing curls, loops, twists or snags from tapes being wound comprises a spindle suitable for being mounted on a tape winder, with two substantially U-shaped jaws protruding from the spindle. Each jaw contains a curved point at the bottom of the U. Tape to be wound is passed between the two jaws and then between the two legs of one jaw and partially around the spindle. The curved point

of one jaw prevents irregularities in the tape from passing between the jaws, while the two legs of the jaw through



which the tape is passed prevent the tape from slithering from side to side during winding.

3,662,969

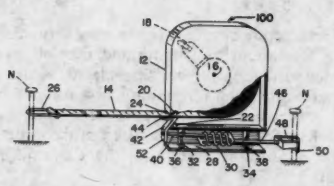
MEASURING TAPE TIGHTENER

Harold M. King, Jarrettsville Pike, Phoenix, Md.

Filed Jan. 21, 1970, Ser. No. 4,526

Int. Cl. G01b *3/10*

U.S. Cl. 242—84.8 **15 Claims**



A measuring tape tightener for tensioning reel-type tapes between two arbitrary points, as between a nail at the free end of the tape and a nail at the case end of the tape, comprising a tape-brake movably attached to the case of the tape, and a spring mounted anchor adapted to attach the case to a nail or the like under spring tension, with the spring tension actuating the brake to prevent the tape from further unreeling.

3,662,970

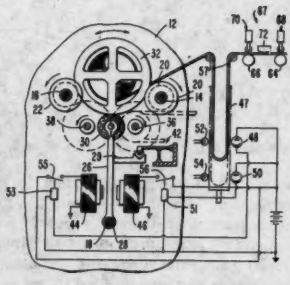
TAPE CONTROL MECHANISM

Paul R. Hoffman, Farmington, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 21, 1970, Ser. No. 65,925

Int. Cl. G03b *1/04*; G11b *15/32*

U.S. Cl. 242—180 **13 Claims**



Apparatus for use in tape handling equipment comprising a plurality of laterally positioned tape reels arranged with their rim peripheries normally spaced from a pair of oppositely rotating driven shafts, the shafts spanning all of the reels axially thereof. Each of the reels is individually cradled on its rim by a set of three spaced apart roller bearings, and at least one of the rollers of each set is shiftable to effect rotation of selected ones of the reels by one or the other of the oppositely rotating shafts.

3,662,971

FILM THREADING AND TRANSPORTING MECHANISM FOR USE IN CINEMATOGRAPHIC APPARATUS

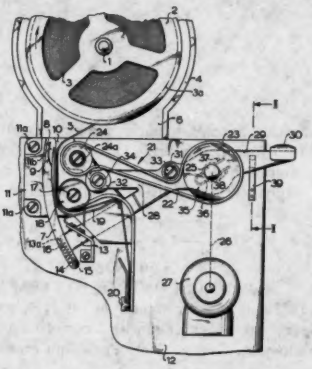
Wolfgang Riedel, Winnenden, Germany, assignor to Silma S.p.A., Rivoli Torinese, Italy

Filed Jan. 18, 1971, Ser. No. 107,363

Claims priority, application Germany, Jan. 29, 1970, P 20 03 957.0

Int. Cl. G03b *1/58*

U.S. Cl. 242—192 **14 Claims**



A film threading and transporting mechanism for use in motion picture projectors wherein the supply reel is rotatable by a drive to pay out the film and wherein the leader of the film is deflected into a channel to advance toward the pull-down. A film transporting wheel is mounted adjacent to the channel and is rotated by the drive when the latter ceases to rotate the supply reel. The drive has a torque transmitting unit mounted on a carrier which is pivotable between a first position wherein a first rotary element of the torque transmitting unit rotates the supply reel in a direction to pay out the film and a second position wherein a second rotary element of the torque transmitting unit drives the film transporting member which then overcomes friction between the supply reel and its spindle and/or between the marginal portion of convoluted film and the flanges of the supply reel to prevent undue tensioning of film by the pull-down. The carrier tends to assume its second position when the first rotary element of the torque transmitting unit rotates in a direction to drive the supply reel so that the latter pays out the film, and is movable from such second position in response to the application of finger pressure which must overcome the resistance of an elastic follower mounted in the housing of the motion picture projector.

3,662,972

MAGAZINE FOR A REEL OF FILM OR THE LIKE

John F. Egan, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

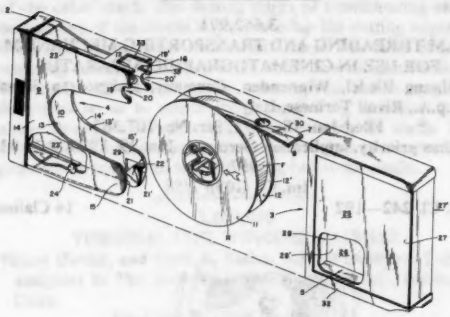
Filed May 8, 1970, Ser. No. 35,803

Int. Cl. G03b *1/04*; G11b *15/32, 23/04*

U.S. Cl. 242—197 **11 Claims**

A cartridge for a reeled strip of web material is inserted into a container to form therewith a light-tight magazine. The

cartridge includes a flexible boss for removably retaining a web reel within the cartridge interior, a projection cooperable with the container to restrain such a retained web reel against movement, a strip engaging finger and barb for disposing the free end of the reeled strip in a position for



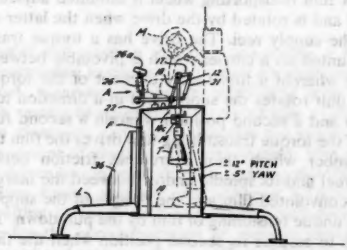
contact for an automatic strip feeding mechanism of apparatus into which the cartridge is insertable for utilization of the strip material, and abutment edges and notches which prevent improper insertion of the cartridge into the apparatus.

3,662,973

FLIGHT CONTROL SYSTEM

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and William A. Collins, 2691 Park Boulevard, Tonawanda, N.Y.

Filed July 31, 1970, Ser. No. 59,966
Int. Cl. B64c *29/00*
U.S. Cl. 244—23 A **16 Claims**



Thrust control apparatus for a spacially movable object such as an air or spacecraft, wherein the roll movements of the craft are controlled through differential throttling of a plurality of thrust engines, and wherein the pitch and yaw movements of the craft are controlled by pivotable movements of the thrust engines. Such apparatus is relatively simple in terms of hardware and operational usage, and it is especially suitable for manned lunar flying and landing in the exploration of the moon after the initial lunar landings from "Apollo" type space vehicles.

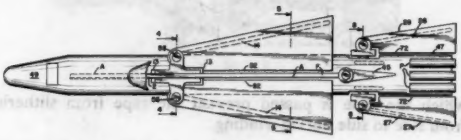
The apparatus has a trimming mechanism to handle a variety of loading conditions on the spacecraft, without changing the position of the operator's controllers.

3,662,974

AIRCRAFT STRUCTURE UNIT AND WING STRUCTURE

Adolphe C. Peterson, 4623 Bruce Avenue South, Minneapolis, Minn.

Filed Sept. 12, 1967, Ser. No. 667,222
Int. Cl. B64c *3/40*
U.S. Cl. 244—46 **7 Claims**



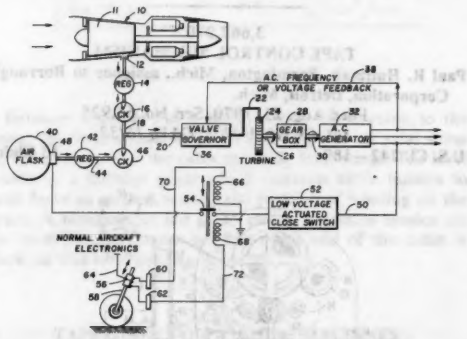
This is an aircraft having variable wing formation of novel form, one formation for landing and take-off performance and another formation for cruising speeds. A novel form of wing actuation for such formation and a form of control for actuation is included. A novel form of structure of the aircraft especially for this means is a part of the structure, and a novel form of airfoil formation for flight control is a part of this aircraft.

3,662,975

AUXILIARY ELECTRICAL GENERATING SYSTEM FOR JET AIRCRAFT

Robert E. Driskill, 4702 Highland Terrace, Humble, Tex.

Filed Sept. 21, 1970, Ser. No. 73,968
Int. Cl. B64d *41/00*
U.S. Cl. 244—58 **3 Claims**



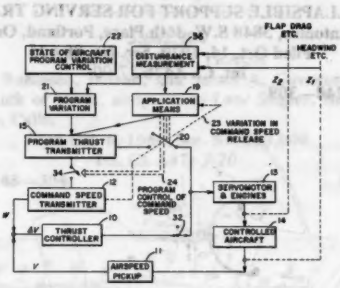
An auxiliary electrical generating system for jet aircraft wherein compressed air is withdrawn from a jet engine and used to operate a pneumatic turbine which in turn drives a generator. An ancillary gas source may be included for supplying compressed gas to the turbine in the event of engine failure. This abstract is neither intended to define the invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to scope of the invention in any way.

3,662,976

SPEED CONTROLLER FOR AIRCRAFT

Hans G. Gesler, Neversdorf, Germany, assignor to Bodenseewerk Geratetechnik, Uberlingen (Bodensee), Germany

Filed May 7, 1969, Ser. No. 822,650
Int. Cl. B64c 19/00
U.S. Cl. 244—77 D 16 Claims



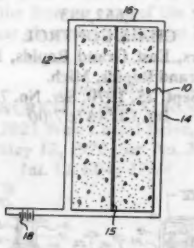
An aircraft speed controller includes a program transmitter which provides a predetermined control program for application to a speed regulating means of the flight control and means for applying the control program to the regulating means upon the occurrence of a disturbance.

3,662,977

AIRCRAFT TAXI GUIDANCE SYSTEM

James A. Shannon, 2923 Q Street, N.W., Washington, D.C.

Filed May 7, 1969, Ser. No. 822,472
Int. Cl. B64f 1/00
U.S. Cl. 244—114 R 1 Claim



An aircraft taxi guidance system in which a controlled magnetic field is set up along the runway-taxiway and a dip needle in the aircraft takes up an equilibrium position which depends on the distance and direction of the aircraft from the center of the runway. When the aircraft is at the center of the runway the dip needle points straight up. When the aircraft is off from the center of the runway, the dip needle will be inclined from vertical at an angle depending on the distance from the center of the runway. Thus, the position of the dip needle indicates the position of the aircraft with respect to the center of the runway.

3,662,978

AIRCRAFT EJECTION SEAT VEHICLE STOWED ROTOR

Richard H. Hollrock, Simsbury, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Oct. 22, 1970, Ser. No. 82,902
Int. Cl. B64d 25/10
U.S. Cl. 244—122 A 13 Claims

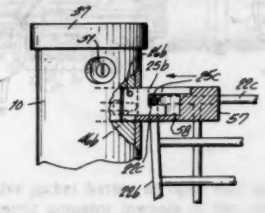
A rocket powered aircraft ejection seat is equipped with a stowed helicopter type rotor, and with a stowed anti-torque tail plane, both of which can be deployed after the seat, together with its occupant, has been ejected from a disabled aircraft. The rotor blades are conventionally mounted on a rotor hub, which hub is pivotally mounted to a mast. The mast is movably mounted to the back of the seat so that the hub and blades are movable from a stowed position behind the seat to a deployed position wherein the rotor hub is disposed above and forwardly of the head of the seat occupant. A small drogue or pilot chute is connected to the rotor hub, and when released from its stowed position between the blades serves to swing the rotor hub and blades from their respective stowed positions to intermediate or trail positions wherein the blades can be allowed to rotate and to unfold by centrifugal force. A first actuator moves the mast to its deployed position, and the rotor is positioned for gliding flight with an associated control column being automatically moved into position between the pilots knees to control the cylic pitch of the rotor blades through a suitable control linkage. The tail plane structure includes a pair of parallel booms each of which carries a stabilizer fin, and these booms are stowed, one on either side of the back of the seat, with these fins being conveniently stowed on either side of the seat portion of the overall structure. A second actuator is drivingly connected to a rock shaft at the upper end of the seat back, which rock shaft is pivotally mounted on the seat for rotatably supporting the booms for rearward and upward movement to deploy the tail plane in response to operation of the second actuator. A small gas turbine engine is stowed in the back of the seat between these booms, and is moved to its deployed position by the second actuator through a collapsible engine mount linkage.

3,662,979

LITTER BASKET MOUNTING AND LOCKING MEANS

Ciro J. Lucci, 402 Foster Avenue, Brooklyn, N.Y.

Continuation-in-part of application Ser. No. 765,065, Oct. 4, 1968, now Patent No. 3,568,966. This application Aug. 4, 1970, Ser. No. 60,892
Int. Cl. F16n 13/00
U.S. Cl. 248—154 2 Claims



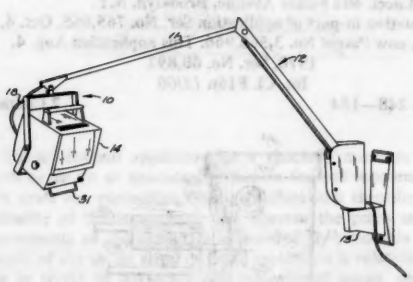
A wire or mesh screen litter basket with or without upper and lower flanges is mounted by its top and bottom on a sup-

porting post adapted to be anchored in the ground in such manner that the litter basket is maintained above ground level and can be locked in supported position from which it can be released only by unlocking with the proper key.

3,662,980
DISPLAY BASE
Seymour Milton Kantor, 9 Erroll Place, and Bertram Lincoln Kantor, 1273 North Avenue, both of New Rochelle, N.Y.
Filed Apr. 6, 1970, Ser. No. 25,894
Int. Cl. F16m
U.S. Cl. 248—161 8 Claims

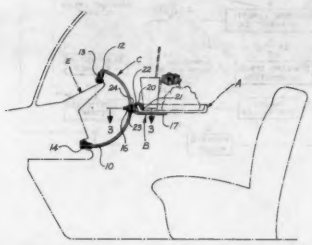
A knocked-down pedestal display base capable of being set up with one securing means including a central member, two pairs of similar legs, each leg including a vertically disposed section and an outwardly extending foot section, the vertically disposed section of one pair of legs being adapted to be secured to the central member and aligned in the same plane, the second pair of legs including lugs adapted for securing one end of the vertically disposed sections of the second pair of legs to the central member and securing means for securing the other end of the vertically disposed sections of the second pair of legs to the central member.

3,662,981
ARTICULATED CARRYING FRAME
Herbert C. Hogrebe, St. Louis, Mo., assignor to Dazor Manufacturing Corp., St. Louis, Mo.
Filed Oct. 24, 1969, Ser. No. 869,004
Int. Cl. A47g 29/00
U.S. Cl. 248—278 1 Claim



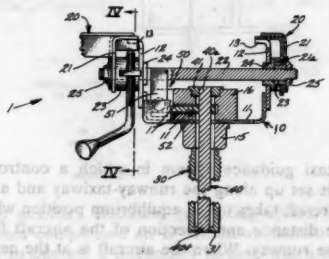
This carrying frame includes upper and lower pivotally interconnected U-shaped members. The lower member is adapted to mount an article thereon and the upper member is adapted to be connected by a swivel member to an adjustable bracket or similar support. The axis of rotation of the pivotal connection between the upper and lower members is so chosen as to pass through or near the center of gravity of the carried article so that a minimum of effort is required to relocate the carried object and so that the article will maintain its relocated position.

3,662,982
COLLAPSIBLE SUPPORT FOR SERVING TRAYS
John I. Antonius, 3848 S.W. 36th Place, Portland, Oreg.
Filed Oct. 14, 1970, Ser. No. 80,625
Int. Cl. A47b 37/00
U.S. Cl. 248—309 1 Claim



The invention utilizes a duality of similar attaching elements, curved, terminally hooked support arm slidably bolted to a smaller 'c' shaped arcuately curved tray clamp. The tray clap has a flat segment to support a serving tray, a curved segment slidably bolted to the support arm, and vertically arcuately rotable around said bolt, and a hooked end which clamps onto the marginal rim of a tray. The support arms are 'c' shaped with a hook at one end, and their elastic structure allows the unit to clamp on an instrument panel of a car or to suspend by means of the terminal hook, the opposite end of the arm resting against a remote area of said instrument panel or such other object as said arm is attached to.

3,662,983
CHAIR CONTROL
Richard H. Wolters, East Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Sept. 25, 1970, Ser. No. 75,448
Int. Cl. A47c 7/00
U.S. Cl. 248—373 14 Claims



The chair control includes a seat support rotatably mounted on a housing, and a hollow spindle connected to the

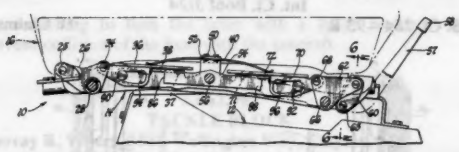
housing and depending downwardly therefrom. A torsion rod is mounted vertically within the spindle and has one end fixed against rotation at the bottom of the spindle. The seat support is connected for simultaneous rotation with an axle, which is rotatably mounted in the housing. A cam lever is secured to and extends downwardly from the axle and engages a follower lever which is operably connected to the free end of the torsion rod. A ball bearing is positioned between the abutting portions of the cam lever and follower lever to minimize friction.

3,662,984

SIX-WAY SEAT TRACK

David S. Robinson, Detroit, and James A. Gavagan, Center Line, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Oct. 6, 1969, Ser. No. 864,000
Int. Cl. A47c 3/20
U.S. Cl. 248—394 8 Claims



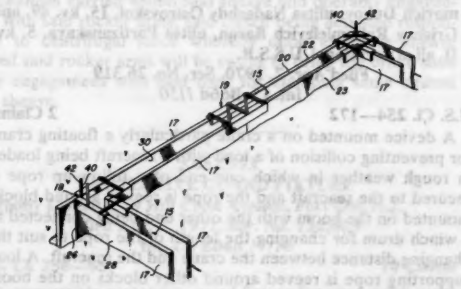
An adjustable seat assembly including a base, a seat frame and means for independently adjusting the vertical elevation of the front and rear portions of the seat frame relative to the base, including on each side of the assembly a pair of links which are pivotally connected between the base and the front and the rear of the frame for rotation between various angular positions to determine the vertical elevation between the front and rear of the seat frame and the base. Each link has connected thereto a latch member which is longitudinally displaced in accordance with the pivotal movement of the associated link. The frame carries catch means including horizontal portions having a plurality of longitudinally spaced slots which are selectively engaged by the respective latch members. A spring biases the latch members into the slots. An actuator means in the form of a manually operated handle is employed to selectively disengage either of the latch members from the catch means thereby to permit independent elevation of the front or rear of the seat frame relative to the base. The rear elevation adjustment is spring assisted.

3,662,985

REUSABLE CONCRETE FORM ALIGNMENT DEVICE

Lonnie E. Parker, 2021 West Cheryl Drive, Glendale, Ariz.

Filed May 13, 1970, Ser. No. 36,928
Int. Cl. E04g 17/14
U.S. Cl. 249—219 R 5 Claims



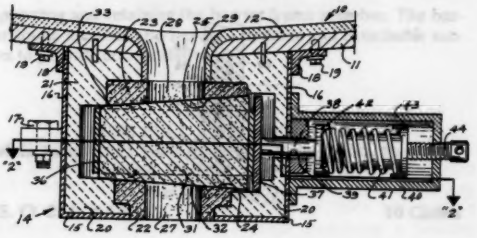
A portable, reusable aligning and retention device for use with stem panels in the forming of the stem portion of concrete foundations for residential structures and other small buildings is shown. The device employs spaced channels with cross-bracing. The channels fit over the top edges of the stem panels, which are plywood panels deployed in verticle position to form the sides of a concrete stem projecting upwardly from a concrete footing. The use of the device on the stem panels dispenses with the necessity for using nails and wooden bracing to hold the stem panels in the proper attitude of use. A ruled standard for use in conjunction with sighting lines is also provided to assist in the alignment of the stem panels.

3,662,986

STOPPER BLOCK

Raymond J. Domulewicz, Sr., 693 Bauernschmit Drive, Baltimore, Md.

Filed Feb. 25, 1970, Ser. No. 13,899
Int. Cl. F16k 5/00
U.S. Cl. 251—144 1 Claim



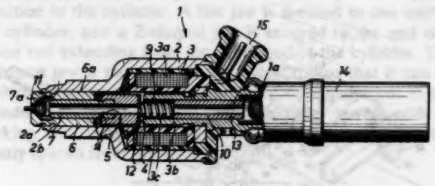
A valve for high temperature liquids, such as molten metals, having both valve member and valve seat composed of heat resistant material such as ceramic, and having the valve member shiftable in a tapered seat positioned laterally of the flow of the liquid through the valve with spring means to urge the valve member into wedging engagement with the seat to maintain close engagement between these members in all positions and prevent leakage of the liquid between the valve member and seat.

3,662,987

INJECTOR VALVE

Walter Schlagmuller, Buetthard, and Rudolf Babitzka, Ludwigsburg-Hoheneck, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 24, 1970, Ser. No. 13,617
Claims priority, application Germany, Feb. 28, 1969, P 19 10 113.4
Int. Cl. F16k 31/06
U.S. Cl. 251—139 1 Claim



An outer valve jacket having an open end accommodates an electromagnetic actuator inwards of the open end. The electromagnetic actuator comprises a solenoid-energized iron core and an armature reciprocable towards and away from the open end, the latter enclosing at least part of a valve

housing and a valve needle in the valve housing. The valve needle is coaxially reciprocably connected with the armature and axially movable in the valve housing between a valve opening and a valve closing position. The valve housing is secured in the open end of the outer jacket in such a way that a circumferential portion of the jacket is radially inwardly upset and accommodated in at least one circumferential groove in the valve housing, the latter having an outer diameter substantially equal to the inner diameter of the outer jacket.

3,662,988

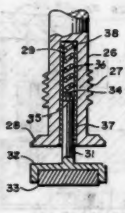
ANTI-REVERSE FLOW AND SYPHON BREAKER VALVE ASSEMBLY

John L. Gibbs, 14820 Miami Lakeway East, and James W. Gibbs, 8027 West 14th Avenue, both of Hialeah, Fla.

Filed June 8, 1970, Ser. No. 44,079

Int. Cl. F16k *31/50*

U.S. Cl. 251—276 **1 Claim**



An anti-reverse flow and syphon breaker valve assembly as a replacement for the valve and valve stem assembly of the conventional bibcock, hose bibs and faucets having a pair of telescopically mounted valve stems, one valve stem having a bore forming a guide for the main valve stem and the bore receiving a relatively light coil spring yieldingly urging the main valve to seat on the valve seat whereby upon threading the main valve to its open position, the pressure of water slides the main valve against the spring pressure to its open position and upon loss of water pressure or upon creation of a syphon effect the main valve is brought to its closed position instantaneously to prevent a reverse flow of water.

3,662,989

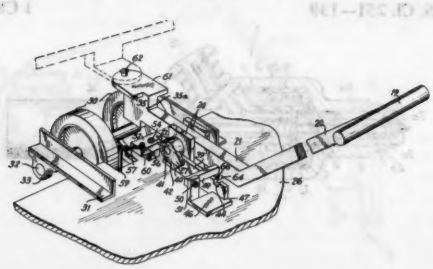
TOWING MACHINE

Ronald D. Swinson, El Paso, Tex., assignor to Farah Manufacturing Company, Inc., El Paso, Tex.

Filed Dec. 11, 1970, Ser. No. 97,101

Int. Cl. B60p *1/48*

U.S. Cl. 254—8 R **11 Claims**



A device has been provided for moving and maneuvering a cart or a skid carrying thereon a load which is desired to be moved. This device comprises a means for propelling manually the device independently of the cart or, when engaged to the cart, propelling it under power, means for engaging and disengaging the cart, and means for holding the cart in an engaged position for maneuvering of the cart and moving it in a desired direction. Further, the device comprises a plate having affixed thereto four wheels and an idle or secondary wheel which idle wheel may be used to disengage two of the wheels from the surface, i.e. floor, over which the cart and the device is being moved. The means for engaging and disengaging the cart are activated merely by appropriate lowering and raising of a handle through a single arc, whereby a number of cooperating cams, cam slides, latches, springs, etc. provide for easy, maintenance-free operation of the device.

3,662,990

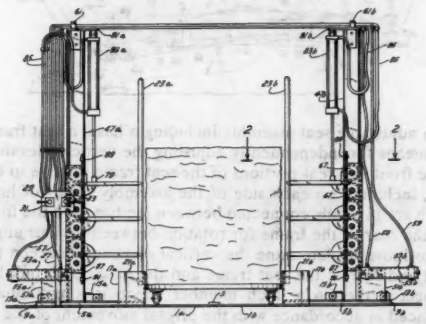
MECHANICAL BREAK HORSE

Joseph Barnett, Wilson, N.C., and John D. Smith, Richmond, Va., assignors to Export Leaf Tobacco Company, Richmond, Va.

Filed Dec. 21, 1970, Ser. No. 99,786

Int. Cl. B66f *3/24*

U.S. Cl. 254—93 R **18 Claims**



Three vertically arranged pairs of inwardly directed probe assemblies are mounted on movable opposed vertical track members. The probes on each track member are linked to one another by a lifting rod so as to sequentially rise when air is supplied to pneumatic cylinders. In use, the probes are first directed into a hogshead of tobacco from opposite sides and then the probes are sequentially lifted, thereby completely separating the hogshead between each point of penetration to allow efficient inspection of the interior.

3,662,991

CRANE DEVICE FOR PREVENTING COLLISION OF LOAD WITH SEACRAFT IN ROUGH WEATHER

Rostislav Ivanovich Lakiza, ulitsa Tolstogo, 20, kv. 14; Petr Ivanovich Soloviev, ulitsa Batumskaya, 13; Vasily Maximovich Dukov, ulitsa Nadezhdy Ostrovskoi, 15, kv. 49, and Grigory Rakhmielevich Baron, ulitsa Partizanskaya, 5, kv. II, all of Sevastopol, U.S.S.R.

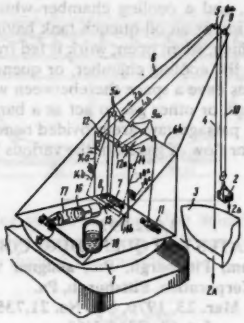
Filed Apr. 7, 1970, Ser. No. 26,319

Int. Cl. B66d *1/50*

U.S. Cl. 254—172 **2 Claims**

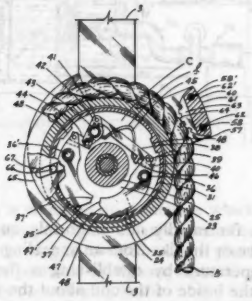
A device mounted on a crane particularly a floating crane for preventing collision of a load with a seacraft being loaded in rough weather in which one end of a follow-up rope is secured to the seacraft and the rope is reeved around blocks mounted on the boom with the other end being connected to a winch drum for changing the length of the rope to suit the changing distance between the crane and the seacraft. A load supporting rope is reeved around other blocks on the boom and blocks on a crosspiece connected with a mechanism for simultaneously tensioning of both ropes to compensate for changes in distance between the crane and seacraft. Such mechanism includes a two-arm lever mounted in the frame

with one arm being connected to the crosspiece and the other arm articulated to a power cylinder-piston unit on the



crane serving to turn the lever with a force required to prevent collision of the load with the seacraft.

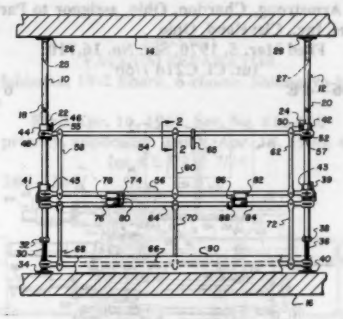
3,662,992
TACKLE BLOCK
Murray B. Vittert, 7566 Wellington Way, Clayton, Mo.
Filed May 28, 1970, Ser. No. 41,321
Int. Cl. B66d *1/36*
U.S. Cl. 254—192 **11 Claims**



A tackle block incorporating a sheave with a rope or other flexible member extending thereover comprising a movable brake shoe presented radially outwardly of the rope receiving portion of said sheave and being carried upon rocker arms adapted for swingable movement about an axis parallel to, but radially outwardly of, the sheave rotation axis. A clutch mechanism carried within said sheave and operably engageable with said rocker arms; said clutch being actuated responsive to centrifugal force whereby upon excessive sheave speed said rocker arms will be swung to bring the brake shoe into engagement with said rope for clamping same against the sheave.

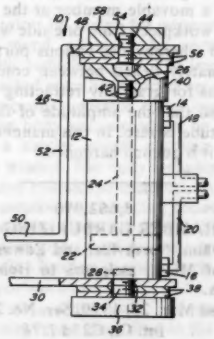
3,662,993
PROTECTIVE GUARD FIXTURE
Anthony Lionetto, 19 Hill Crest Avenue, Fort Lee, N.J.
Filed Apr. 7, 1971, Ser. No. 132,005
Int. Cl. E04h *17/16*
U.S. Cl. 256—65 **10 Claims**

A convertible protective guard fixture for open work areas in building construction having two vertical posts which support a barrier frame member. The vertical posts having movable collars with a first locking means attatched to each collar in vertical positioning of the collar on the vertical post and a second locking means attatched to each collar used for



supporting and retaining the barrier frame member. The barrier frame member also having a foldable and detachable section to provide convertibility.

3,662,994
PUSH-PULL JACK APPARATUS
Melvin Johns, 1401 North 8th Street, Philadelphia, Pa.
Filed Aug. 12, 1970, Ser. No. 63,181
Int. Cl. B66f *3/24*
U.S. Cl. 254—93 R **10 Claims**



A push-pull jack for use in either pushing apart or pulling together two rigid members. The jack includes a cylinder, a piston in the cylinder and means for admitting air or a fluid under pressure into the cylinder to move the piston in either direction in the cylinder. A flat jaw is secured to one end of the cylinder, and a Z-shaped jaw is secured to the end of a piston rod extending from the other end of the cylinder. The Z-shaped jaw is mounted on the piston rod so that it can be positioned either with its working arm being adjacent to the cylinder and closely spaced from the other jaw or with its working arm being spaced from the end of the cylinder and greatly spaced from the other jaw.

ERRATUM

For Class 256—65 see:
Patent No. 3,662,993

ERRATUM

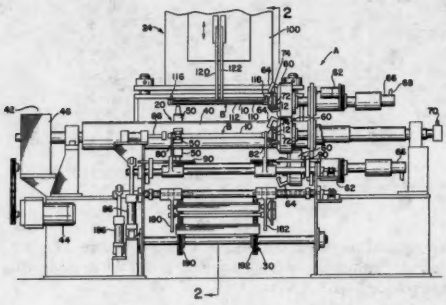
For Class 259—2 see:
Patent No. 3,662,806

3,662,995

METHOD AND APPARATUS FOR INDUCTIVELY HEATING AND QUENCH HARDENING AN ELONGATED WORKPIECE

Robert G. Armstrong, Chardon, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Mar. 5, 1970, Ser. No. 16,710
Int. Cl. C21d *1/66*
U.S. Cl. 266—4 E **6 Claims**



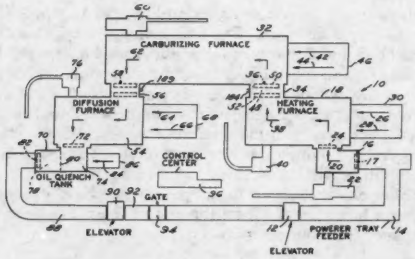
A device for inductively heating and quench hardening an elongated workpiece including a heating station having single-turn inductor extending the length of the workpiece for heating the total workpiece simultaneously and as it is rotated; a quenching station having an elongated quench body for quenching the total workpiece simultaneously and as it is rotated; a movable member at the quenching station for bending the workpiece from one side while the workpiece is being rotated whereby the various portions of the workpiece are alternately flexed between compression and tension; and, means for gradually retracting the member from the workpiece so that the amplitude of flexing is decreased until this amplitude is zero. In this manner, the workpiece is straightened as it is quench hardened.

3,662,996

MULTI-CHAMBER CARBURIZING APPARATUS

Donald J. Schwalm, Northville, and Edward C. Bayer, Dearborn, both of Mich., assignors to Holcroft & Company, Livonia, Mich.

Filed Mar. 23, 1970, Ser. No. 22,501
Int. Cl. C21d *1/78*
U.S. Cl. 266—4 A **17 Claims**



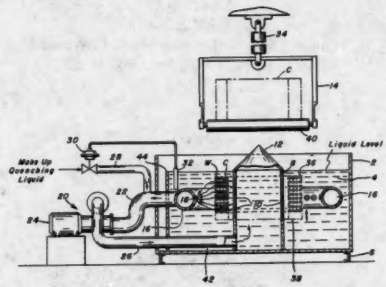
The multi-chamber carburizing apparatus results in a continuous process including a heating furnace having inlet door means through which, when open, work is fed into the furnace, a carburizing furnace connected thereto, interconnecting double door means between the heating furnace and the carburizing furnace through which, when open, work is fed from the heating furnace into the carburizing furnace, a diffusion furnace, interconnecting double door means between the carburizing furnace and diffusion furnace through which, when open, work is fed from the carburizing furnace into the diffusion furnace, and a cooling chamber which may be a water cooled section or an oil quench tank having inlet door means through which, when open, work is fed from the diffusion furnace into the cooling chamber, or quench tank. The double door means have a space therebetween which may be filled with a neutral or other gas to act as a barrier between the furnaces. Gas passageways are provided beneath the various door means for flow of gas from the various furnaces at a controlled rate.

3,662,997

APPARATUS FOR QUENCHING COILS

William M. Bloom, Pittsburgh, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Mar. 23, 1970, Ser. No. 21,735
Int. Cl. C21d *1/62*
U.S. Cl. 266—6 R **6 Claims**



Apparatus for rapidly and uniformly quenching coils of steel rod, tube or the like from an annealing temperature to a quench temperature by establishing a flow of quenching liquid from the inside of the coil about the wraps to the outside of the coil at a flow rate sufficient that the quenching liquid is maintained in its liquid state. The apparatus includes a quenching bath, means for lowering the coils into the bath, quenching liquid supply means disposed within the central open portion of the coils when lowered in the bath in quenching position, means to collet quenching liquid from around the outside diameter of the coils when in quenching position, and circulating means for providing a forced flow of quenching liquid from the supply means through the wraps of the coil to the collecting means. Preferred embodiments include a means for recirculating the quenching liquid, means for removing heat picked up from the coil wraps and means for controlling the temperature of the bath.

3,662,998

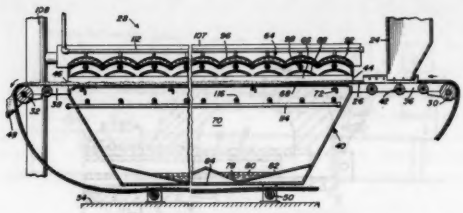
MERCURY, VAPOR TYPE ORE REDUCTION APPARATUS AND METHOD

Edwin F. Stratton, Boise, Idaho, assignor to Mercury Processors, Inc.

Filed Mar. 16, 1970, Ser. No. 19,782
Int. Cl. F27d *17/00*
U.S. Cl. 266—16 **10 Claims**

A crushed ore is conveyed through a series of roasting chambers located below associated heat generating zones.

Mercury vapors released from the ore descend from the roasting chambers into a condensing chamber and pass



through cooling sprays of water. The liquefied mercury and water is collected at the bottom while non-condensible gases are withdrawn through flue outlets.

3,662,999

APPARATUS FOR CUTTING THICK-WALLED TUBULAR ELEMENTS

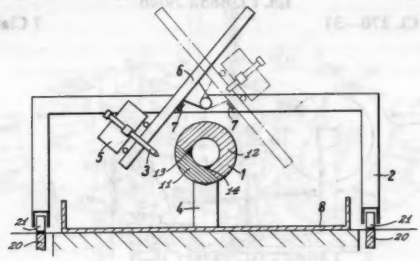
Herbert Meyer, Oberhausen-Sterkrade, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Oct. 23, 1970, Ser. No. 83,490

Claims priority, application Germany, Oct. 29, 1969, P 19 55 395.8

Int. Cl. B23k *7/04*

U.S. Cl. 266—23 NN **3 Claims**



A cutting torch is mounted on a carriage which, in turn, is mounted on an arm pivoting on an axis parallel to the axis of a pipe to be cut. Cutting is carried out in a plane, and from two different pivot positions along correspondingly different directions to obtain two merging kerfs.

3,663,000

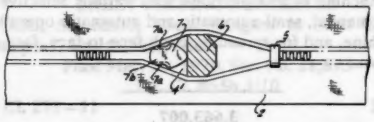
METHOD AND APPARATUS FOR ATTACHING SLIDERS TO A SLIDE FASTENER CHAIN

Morris Perlman, 1664 51st Street, Brooklyn, N.Y.

Filed Feb. 18, 1970, Ser. No. 12,264

Int. Cl. B23p *19/04, 11/00*

U.S. Cl. 29—207.5 SL **19 Claims**



A method and apparatus for attaching sliders to a slide fastener chain having longitudinally spaced gaps free of coupling elements, in which, while the chain is held in taut condition, a gap at an assembly station is spread in transverse direction, a slider is placed in the spread gap, and then the chain pulled under tension in longitudinal direction in such a manner that the adjacent side edges of the stringers of the chain are forced into the slider channel to thus attach the slider to the chain. The chain is then moved together with the slider attached thereto in longitudinal direction until the next gap is at the assembly station, whereafter the cycle is repeated.

3,663,001

VACUUM SEPARATOR

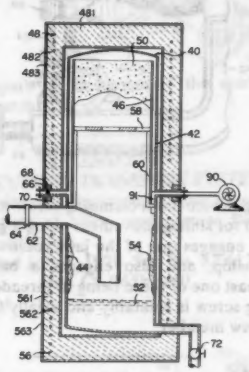
Hiroshi Ishizuka, 19-2 Ebara, 6-chome, Shinagava-ku, Tokyo, Japan

Filed Apr. 16, 1969, Ser. No. 816,610

Claims priority, application Japan, Apr. 18, 1968, 43/26074

Int. Cl. C21c *7/10*

U.S. Cl. 266—34 V **5 Claims**



A vacuum separator of metal for separating impurities from half-refined metal prepared by reducing a metal chloride by a metallic reducing agent. The impurities include the surplus or unreacted metallic reducing agent and reaction by-products. The vacuum separator comprises a body and a heating furnace. The body accommodates an inner cylindrical member with a carrier means carrying reduced half-refined metal to be treated. The body includes an upper portion holding the inner cylindrical member, and a lower portion receiving the surplus or unreacted reducing agent and the reaction by-products. The furnace includes a conduit connected to a vacuum pump to reduce the inner pressure of the body, a first portion heating the inner cylindrical member held by the upper portion of the body, and a second portion heating the lower portion of the body. The second portion of the furnace melts away crusts deposited in the vessel as solid substance firmly adhered to the wall of the lower portion of the body.

3,663,002

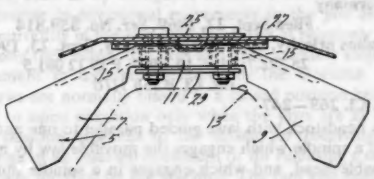
DYNAMIC DAMPER

Robert G. Gergle, Troy, and Zdravko D. Dobrasevic, Detroit, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 31, 1970, Ser. No. 68,702

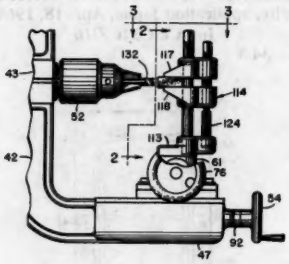
Int. Cl. F16f *1/36*

U.S. Cl. 267—136 **4 Claims**



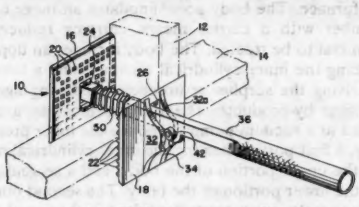
Tuned mass adapted to be connected to vehicle body to dampen body vibrations.

3,663,003
MILLING VISE
Glenn B. Morse, 321 Fountain Street, N.E., Apt. 1, Grand Rapids, Mich.
Continuation-in-part of application Ser. No. 618,216, Feb. 23, 1967, now Patent No. 3,470,789. This application July 17, 1969, Ser. No. 842,676
Int. Cl. B23q 3/18; B25b 5/16
U.S. Cl. 269—60 10 Claims



This milling device has a clamping screw engaging a pair of jaws mounted for sliding movement along a guideway. An adjusting screw engages one of the jaws rotatively in restrained axial relationship, and also engages a base in the same manner (at least one of these being in threaded engagement). The adjusting screw is rotatably and axially free with respect to the other jaw member.

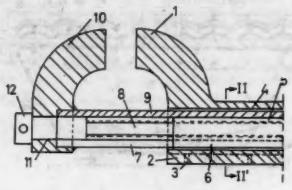
3,663,004
CLAMPING DEVICE
Adam Hupert, 50 Harbor Road, Port Tobacco, Md.
Filed Oct. 15, 1970, Ser. No. 80,958
Int. Cl. B25b 5/02, 5/08
U.S. Cl. 269—157 10 Claims



A clamping device wherein an actuating lever is pivotally mounted to a first clamping plate and extends to a second clamping plate disposed parallel to the first plate. The lever engages the second plate in a manner to force the plates together into a clamping position upon movement of the lever.

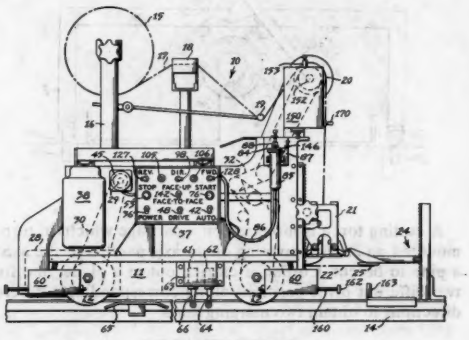
3,663,005
HEADSTOCK
Carl Ullrich Peddinghaus, Strasse 268, Wuppertal-Barmen, Germany
Filed Sept. 22, 1969, Ser. No. 859,814
Claims priority, application Germany, Sept. 23, 1968, P 17 28 292.7; Mar. 10, 1969, P 19 12 001.5
Int. Cl. B25b 1/10
U.S. Cl. 269—247 11 Claims

A headstock with jaws guided parallel to one another, and with a spindle which engages the movable jaw by means of a drivable head, and which engages in a spindle nut which is stationary in relation to the fixed jaw, the spindle being enclosed or surrounded by a guiding tube formed with a longitudinal slot in its under side, in which a web attached to the spindle nut engages, the flanks of this web forming guides for the slides of the slot in the guiding tube.



The guiding tube may be of circular cross-section, or may be of angular cross-section, with a horizontal web at the top and two lateral vertical flanges.

3,663,006
ELECTRICALLY CONTROLLED CLOTH SPREADING MACHINE
Robert W. Benson; James Ronald Chapman; Robert G. Reed, and Hoyt L. Smith, all of Nashville, Tenn., assignors to Cutters Machine Company, Inc., Nashville, Tenn.
Filed Sept. 12, 1969, Ser. No. 857,509
Int. Cl. B65h 29/46
U.S. Cl. 270—31 7 Claims



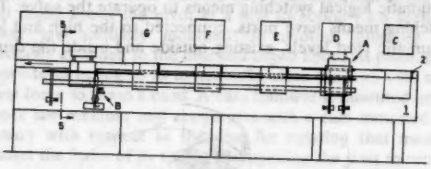
An electrically driven and controlled cloth spreading machine including means for reversing the travel of the machine, means for controlling the high and low speeds of the machine, means for causing the machine to fail safe at low speed upon power failure and open circuit conditions caused by different changes in function of the machine.

The machine is also provided with various selective controls for manual, semi-automatic and automatic operation of the machine, and for spreading cloth face-to-face, face-up or face-down.

3,663,007
TIPPING APPARATUS FOR A SIGNATURE GATHERING MACHINE
Alfred Preiter, Augsburg, Germany, assignor to Grapha Maschinenfabrik Hans Muller AG, Zofingen, Germany
Filed May 7, 1970, Ser. No. 35,447
Int. Cl. B65h 5/30
U.S. Cl. 270—55 9 Claims

Apparatus for the tipping of inserts or supplements onto a plurality of signatures on a signature gathering device. The

apparatus includes a transport device for conveying the signatures, a plurality of signature feeding devices, an insert



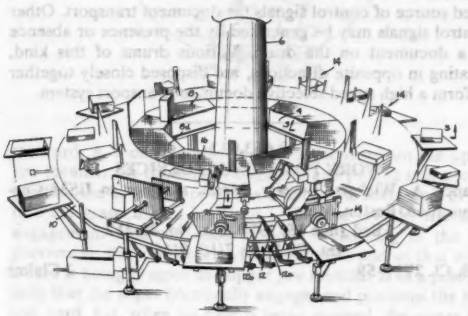
feeding device, ad a device for adjusting the position of each insert relative to the assembled signatures.

3,663,008

STUFFING MACHINE FOR ASSEMBLING NEWSPAPERS OR THE LIKE

Rehn Claus Peterson, Bethlehem; Robert Alexander St. Denis, and Douglas Thomas Steckel, both of Easton, all of Pa., assignors to Harris-Intertype Corp., Cleveland, Ohio

Filed Oct. 14, 1969, Ser. No. 866,258
Int. Cl. B65h *5/30*
U.S. Cl. 270—55 **21 Claims**



A newspaper stuffing machine for assembling the sections of a newspaper, which includes a generally toroidal rotor carrying an endless series of carrier pockets past a series of feeding stations. The feeding stations feed sections of the newspaper into each pocket as it moves past the stations. The rotor is rotatably mounted upon a frame with both the rotor and the frame having generally aligned, vertically extending, central openings of sufficient size to enable the stuffing machine to be assembled about an obstruction, such as a building column.

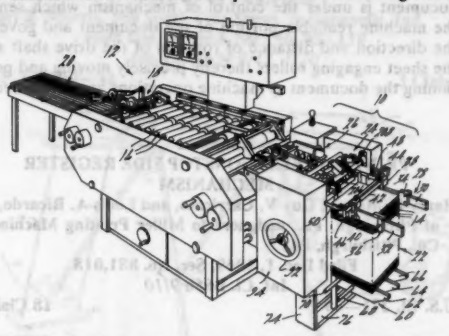
3,663,009

SHEET FEEDING APPARATUS

Joe Scott, Southfield, Mich., assignor to Scott Equipment Company, Inc., Detroit, Mich.

Filed Mar. 23, 1970, Ser. No. 21,893
Int. Cl. B65h *3/10*
U.S. Cl. 271—11 **54 Claims**

An apparatus for feeding successive sheets of workstock from a stack or pile thereof and including a sheet storage assembly adapted to operatively support a stack or plurality of sheets of workstock, a delivery assembly for conveying successive sheets of workstock to an associated machine or other operative destination where the workstock sheets are to have some operation performed thereon, and a transfer mechanism for individually transferring successive workstock sheets from the stack thereof to the delivery assembly, the transfer mechanism including at least one vacuum pickup element and means supporting the element for compound movement about rotational and pivotal axes extending trans-



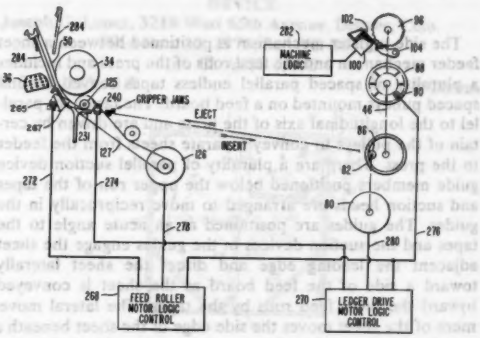
versely of the path of movement of the workstock sheets through the apparatus.

3,663,010

DOCUMENT TRANSPORT SYSTEM

Harold M. Frederick, Birmingham, and Edward A. Nicol, Farmington, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed July 6, 1970, Ser. No. 52,612
Int. Cl. B65h *5/10*
U.S. Cl. 271—14 **40 Claims**



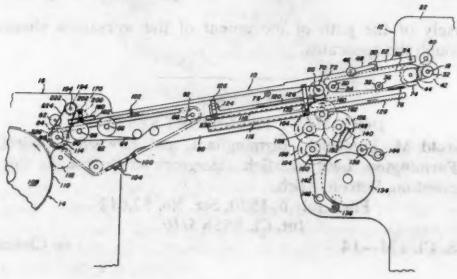
This invention applies to a document transport system for rapid and precise movement and positioning of sheet material and particularly to such a system adapted for use in business machines. The system includes reciprocating sheet gripping means for moving and positioning a document having machine readable and human readable portions thereon. The document gripper provision includes a pair of jaw assemblies for gripping the leading edge portion of a document inserted into the throat of the machine. Each jaw is individually mounted on a support arm or rail for mutual travel in a bi-directional fashion perpendicular to the document inserting throat. A reversely rotatable drive shaft is coupled to the jaw assemblies, such as by elongated flexible members, for imparting precise bi-directional movements to the jaw assemblies concurrently in the same direction and at relatively high speeds along their respective rails and for accurately stopping the document in different positions in the machine. The gripper jaws are normally biased to a closed position but are activated to open condition only when the jaws are at their terminal position adjacent to the throat for receiving the leading edge of an inserted document or for releasing a document already handled by the machine. The pull and push action of the document gripping mechanisms are assisted by document engaging rollers adjacent to the throat of the machine whose speed and direction of rotation is controlled

so as to impose a tension on the document at all times while it is in the machine. The movement and positioning of the document is under the control of mechanism which senses the machine readable portion of the document and governs the direction and distance of rotation of the drive shaft and the sheet engaging rollers thereby precisely moving and positioning the document as machine operations are performed.

3,663,011
PRINTING PRESS NONSTOP SIDE REGISTER MECHANISM

Harry E. Mowry; Guy V. Carricato, and Louis A. Ricardo, all of Pittsburgh, Pa., assignors to Miller Printing Machinery Co., Pittsburgh, Pa.

Filed Dec. 1, 1969, Ser. No. 881,018
Int. Cl. B65h 9/10
U.S. Cl. 271—49 **18 Claims**



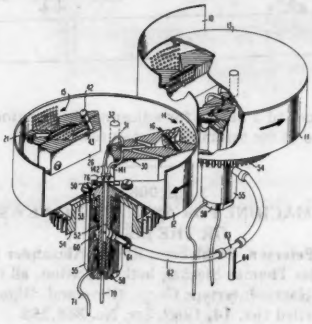
The side register mechanism is positioned between a sheet feeder mechanism and the feed rolls of the press and includes a plurality of spaced parallel endless tapes reeved around spaced pulleys mounted on a feed board. The tapes are parallel to the longitudinal axis of the press and are driven by certain of the pulleys to convey separate sheets from the feeder to the press. There are a plurality of parallel suction device guide members positioned below the upper run of the tapes and suction heads are arranged to move reciprocally in the guides. The guides are positioned at an acute angle to the tapes and the suction devices in the guides engage the sheet adjacent the leading edge and direct the sheet laterally toward a side of the feed board as the sheet is conveyed toward the press feed rolls by the tapes. The lateral movement of the sheet moves the side edge of the sheet beneath a rotating brush member that urges the sheet side edge against a moving vertical endless side guide tape. The rotating brush member urges the sheet side edge against and maintains the sheet side edge in abutting relation with the side guide tape. The sheet is thus brought into and maintained in side register and conveyed in side register to the feed rolls. Endless driven chains with stop members move at a slightly lower linear velocity than the main conveying tape so that the front edge of the sheet is maintained in abutting relation with the stops. The suction devices are arranged in pairs and are retracted as they move rearwardly toward the feeder.

3,663,012
DOCUMENT HANDLING DEVICE PROVIDED WITH A NUMBER OF ROTATABLE HOLLOW DRUMS WITH SUCTION OPENINGS

Taco H. Van Den Honert, Laren, N.H., Netherlands, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1969, Ser. No. 881,798
Claims priority, application Netherlands, Feb. 10, 1969, 6902032
Int. Cl. B65h 5/12
U.S. Cl. 271—51 **7 Claims**

Suction openings in a rotating drum are alternately connected to or disconnected from the vacuum maintained inside the drum, when this is necessary to grip and transport a document, and to release it, respectively. Activation of a group of suction openings is effected by a diaphragm valve, supported by the drum in the interior thereof, with associated pneumatic logical switching means to operate the valve. The switching means have ports, connected to the high and low pneumatic feed levels, existing outside and inside the drum,

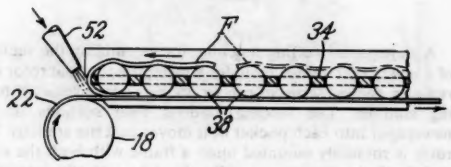


respectively, and to a pneumatic signal line, providing a connection, insensitive to the drum rotation, with an external, fixed source of control signals for document transport. Other control signals may be generated by the presence or absence of a document on the drum. Various drums of this kind, rotating in opposite directions, are disposed closely together to form a high speed selective document transport system.

3,663,013
WORK POSITIONING DEVICES

Francis A. Wickers, Beverly, Mass., assignor to USM Corporation, Boston, Mass.

Filed June 15, 1970, Ser. No. 46,212
Int. Cl. B65h 7/10, 9/16
U.S. Cl. 271—59 **2 Claims**



A bottom feeding mechanism, comprised of a plurality of caged balls and an endless belt in frictional driving contact therewith, is provided with an edge gage for uniformly positioning work pieces, especially flexible sheet material such as fabric, fed onto the balls. In addition to adjustably determining a selected marginal position and/or a line of feeding, for instance as required for hemming and/or stitching machines, the device is adaptable for turning over successive work pieces and aligning them in uniform manner.

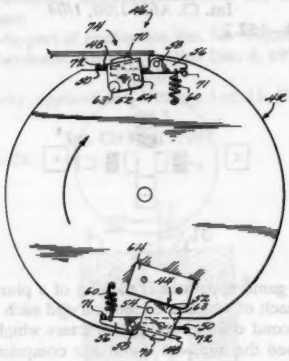
3,663,014
RETRACTABLE CARD GRIPPER

William J. Wasylenko, Philadelphia, Pa., assignor to Control Data Corporation, Minneapolis, Minn.

Filed June 5, 1970, Ser. No. 43,964
Int. Cl. B65h 29/06
U.S. Cl. 271—82 **4 Claims**

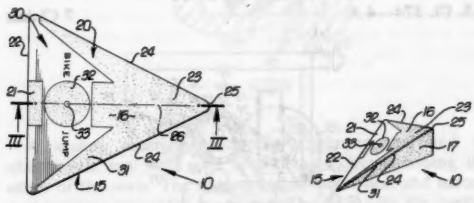
An improvement in a card transporting device of the type including a pair of coaxially mounted, continuously rotating discs, each having a number of card gripper assemblies, each

cooperating with an assembly on the disc for receiving a card, transporting it to the bottom of a stack of cards and placing it there. Each assembly includes an upper jaw mounted on a member which is pivotably attached to the disc and urged about the pivot in a first direction by a spring, a lower jaw similarly mounted on another member also pivotably attached to the disc and urged about its pivot in the opposite direction so as to normally close the jaws with sufficient force to grasp a card. A cam follower is mounted on the upper jaw member and cooperates with a cam mounted stationary with respect to the disc for rotating that member against the force of its spring and opening the jaws to receive



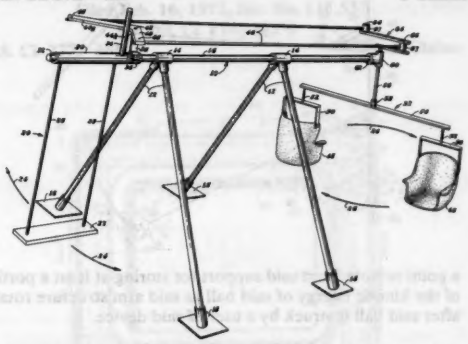
the card. A wiper member is further mounted on the upper jaw member for frictionally engaging and pulling into proper position the bottom card on the stack at the same time or before the grasped card is stripped from the jaws by frictional engagement with the stack bottom. According to the improvement, the lower jaw has a hook on its end so that when a card is being grasped the upper jaw member is in a position such that the wiper frictionally engages and positions the bottom card, but, when no card is being grasped, the upper jaw member is in a position such that the wiper misses the bottom card, thus avoiding unnecessary card wear and stack vibration.

3,663,015
BIKE JUMP
Samuel Fred Bynder, and Milton T. Swimmer, both of 10609 Gothic Street, Granada Hills, Calif.
Filed Dec. 17, 1970, Ser. No. 99,059
Int. Cl. A63g *31/00*
U.S. Cl. 272—1 R **6 Claims**



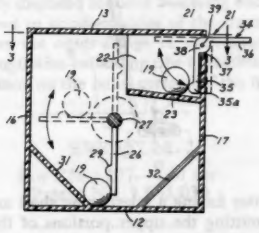
The bike jump has a generally wedge shaped body with upwardly inclined top surface having a wide lower entrance zone and a pointed jump departure zone from which the bike departs for maximum leap distance for a selected bike speed.

3,663,016
SWING APPARATUS
Earl R. Morris, 560 South Cole Street, Indianapolis, Ind.
Filed Dec. 8, 1969, Ser. No. 883,118
Int. Cl. A63g *9/12, 1/20*
U.S. Cl. 272—41 **3 Claims**



A swing set apparatus, providing that the pendulum-type swinging movement of a swing also provides the power for the revolving movement of a seat assembly on other portions of the apparatus.

3,663,017
GAME APPARATUS AND ALPHABET TEACHING DEVICE
Joseph G. Lopez, 3210 West 65th Avenue, Denver, Colo.
Filed Nov. 12, 1970, Ser. No. 88,832
Int. Cl. A63b *63/00*
U.S. Cl. 273—1 R **8 Claims**

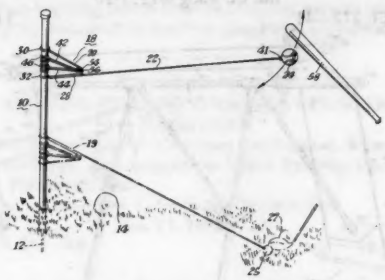


A game device particularly suitable for teaching purposes includes a hollow body containing a plurality of movable objects, preferably balls, each marked with distinctive indicia. A plurality of compartments are arranged longitudinally of an upper portion of the body. A manually operable flap, contained within the body, is swingably mounted to sweep the movable objects upwardly from the bottom of the body into the compartments in a single upstroke and return means return movable objects to the bottom of the body. As an alphabet toy each compartment has alphabet indicia corresponding to alphabet indicia of one of the movable objects and in the play those objects which are not in a corresponding compartment are returned to the bottom of the body and the procedure is repeated until all of the movable objects are in a corresponding compartment.

3,663,018
BATTING PRACTICE TETHERED BALL
Robert E. O'Leary, McKeesport, Pa., assignor to Olos Corporation, Monroeville, Pa.
Filed July 23, 1969, Ser. No. 844,215
Int. Cl. A63b *69/40*
U.S. Cl. 273—26 A **9 Claims**

I disclose a batting practice device comprising a support, a relatively rigid arm structure rotatably mounted on said sup-

port and having a practice ball or similar projectile mounted adjacent its outward free end, and biasing means non-rotatably secured to said support and to said arm structure at



a point remote from said support for storing at least a portion of the kinetic energy of said ball as said arm structure rotates after said ball is struck by a user of said device.

3,663,019

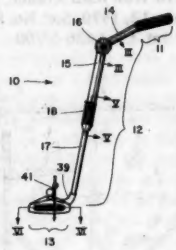
ADJUSTABLE GOLF PUTTER

John J. Palotsee, J. P. Putter & Guide Company, Box 1225, Youngstown, Ohio

Filed Jan. 28, 1970, Ser. No. 6,471

Int. Cl. A63b *53/16*

U.S. Cl. 273—81.3 **1 Claim**



A golf putter having a telescoping shaft and a swivel connection permitting the upper portions of the shaft and the grip to be angled relative to the main portion of the shaft and the putter head.

The swivel connection allows the upper portion of the shaft to pivot in a plane parallel to the ball-striking face.

3,663,020

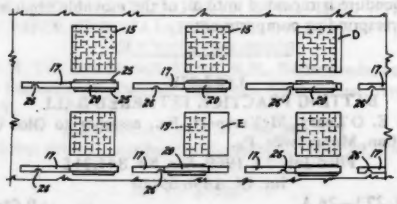
BINGO GAME BOARDS

James F. Moore, Jr., Englewood, Colo., assignor to Moore & Hansen Mfg. Co., Englewood, Colo.

Filed Mar. 13, 1970, Ser. No. 19,353

Int. Cl. A63f *3/06*

U.S. Cl. 273—135 B **1 Claim**



A bingo board of the type shown in prior U.S. Pat. No. 2,778,642 provided with guide slots positioned below windows in a front board with finger grips slidably mounted in said slots for shifting number-covering tabs across said windows and having a protuberance positioned in each guide slot to be engaged by the tab of the slot for frictionally limiting and controlling the movement of the finger grip therein. The protuberances are positioned at different selected positions along their guide slots and are out of vertical alignment. A resetting sheet is mounted behind the front board which when laterally shifted shifts all of the tabs to open position.

3,663,021

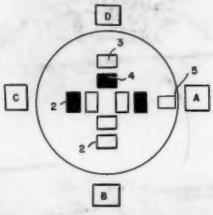
METHOD OF PLAYING A BINARY CARD GAME

Walt Whippo, 110 Sunset Drive, Cocoa Beach, Fla.

Filed Oct. 6, 1970, Ser. No. 78,464

Int. Cl. A63f *1/00, 1/04*

U.S. Cl. 273—152.2 **1 Claim**



A binary game apparatus consisting of a plurality of playing pieces each of which are identical and each of which has first and second distinguishing characters which are respectively assigned the numbers 0 and one comprising the numbers in the binary system having base 2. The playing pieces may be cards, and each card may have one white face representing the number 0 and an opposite black face representing the number 1. When such cards are arranged adjacent, those displaying upward the character representing the number 1 have the following values; the one farthest to the right has the value 1, the next to the left the value 2, the next to the left the value 4, the next to the left the value 8, and continuing if desired with each such card representing the binary number one placed next to the left doubling in value. The cards or other playing pieces displaying upward the character representing the number 0 have the value of 0 regardless of their position. The total value of a row of adjacent playing pieces is determined by adding together the values so represented by the displayed characters of each piece, whereby a variety of number games may be played.

3,663,022

APPARATUS FOR SHIFTING MAGNETIC HEAD IN MULTI-TRACK TAPE PLAYER

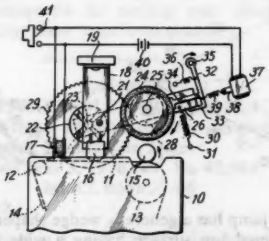
Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan

Filed June 22, 1970, Ser. No. 48,008

Claims priority, application Japan, June 23, 1969, 44/58505; 44/58506

Int. Cl. G11b *21/08*

U.S. Cl. 274—4 A **7 Claims**



An apparatus for shifting a magnetic head in multi-track magnetic tape player comprising cam means for positioning

the magnetic head when rotated in a manner of corresponding to a plurality of discrete and separate recordtrack on the tape, a frictional wheel rotatable by selective abutment against a rotary capstan for driving the tape, a mechanism for controlling abutment of the frictional wheel with the capstan, a gearing for reducing rotation of the wheel to impart this rotation to the cam means, and a brake member adapted to abut against the wheel at the periphery thereof to brake rotation of the wheel at a point where the magnetic head is moved by one step by the cam means.

3,663,023

LABYRINTH GAP SEAL

Reinhold Leidenfrost, Schwabacherstrasse 28, Birkenstrafe, 101, Germany

Continuation-in-part of application Ser. No. 748,681, July 30, 1968, now abandoned. This application Dec. 4, 1970, Ser. No. 95,160

Claims priority, application Germany, Aug. 11, 1967, P 16 50 083.7

Int. Cl. F16j *15/44*

U.S. Cl. 277—56 **3 Claims**

A gap seal having a labyrinth interface between two concentric rings having a means for expelling foreign matter which penetrates said interface and process for the production of said gap seals.

3,663,024

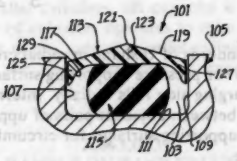
SEALING ASSEMBLY

Henry A. Traub, Pacific Palisades, Calif., assignor to W. S. Shamban & Co., Los Angeles, Calif.

Filed July 2, 1970, Ser. No. 51,950

Int. Cl. F16j *15/24*

U.S. Cl. 277—165 **9 Claims**



A sealing assembly including a slipper seal and an elastomeric seal with one of the seals circumscribing the other of the seals. The slipper seal includes first and second end portions separated by a central portion with the central portion having a circumferential surface adapted to slidingly and sealingly engage a member. The circumferential surface is generally flat in axial cross section and the first and second end portions taper radially away from such member so that they do not engage such member.

3,663,025

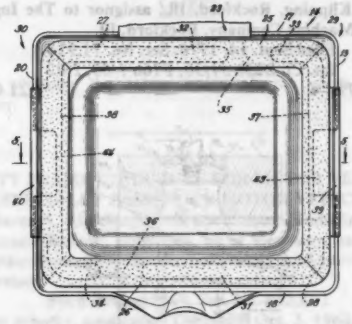
SEALING ASSEMBLY FOR RAILWAY CAR JOURNAL BOX LID

Rudolph E. Nadherny, Naperville, and Edward Payson Smith, Winnetka, both of Ill., assignors to Illinois Railway Equipment Company, Chicago, Ill.

Filed Feb. 16, 1971, Ser. No. 115,531

Int. Cl. F16j *15/06*

U.S. Cl. 277—189 **8 Claims**



A rectangular neoprene foam gasket for application to the inside of a journal box lid has generally U-shaped aluminum frame members embedded therein with the arms spaced apart and intermediate sections along the sides having channel shaped extensions for overlying the respective inturned edge portions of the lid. The arms of the frame members are of different lengths with the shorter arms spaced from the longer arms. The gasket comprises two pairs of generally L-shaped oppositely disposed sections overlying each other and adhesively secured to opposite sides of the frame members. Tabs extend from the outer flange of each channel section and they have lengthwise extending ribs to facilitate retention in bent over position on the outer surface of the lid.

ERRATUM

For Class 277—140 see:
Patent No. 3,663,030

3,663,026

IMPELLER FOR SMALL-SIZE PUMPS

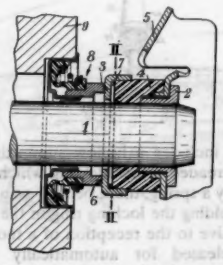
Antonio Mincuzzi, Midland, Italy, assignor to Societe Internationale De Mecanique Industrielle S.A., Luxembourg, Luxembourg

Filed July 9, 1970, Ser. No. 53,528

Claims priority, application France, July 29, 1969, 6925889

Int. Cl. F16j *15/34*

U.S. Cl. 277—237 **4 Claims**



An impeller of the type broadly set forth hereinafter which is capable of transmitting electric current between the im-

peller shaft and the friction disk frictionally engaged by shaft seal or packing. Now this possibility is particularly advantageous when it is contemplated to control an electromagnetic device rigid with the shaft. In this case, the electric control current must flow to the shaft via the packing and the friction ring supported by the resilient member consisting generally of insulating material.

3,663,027

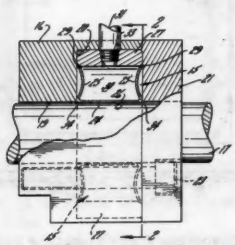
FLUID ACTUATED CLAMP

James L. Klipping, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed Sept. 14, 1970, Ser. No. 71,914

Int. Cl. B23b *31/30*; F16b *1/00, 2/02*

U.S. Cl. 279—4 **21 Claims**



A bowed web of resiliently flexible material is deflected toward a straightened condition by pressure fluid and creates a clamping force with a toggle action to lock first and second parts against relative sliding and/or rotation.

3,663,028

TOOL HOLDER WITH SPRING OPERATED NUT

John L. King, Jr., and Roland G. Koch, both of Frankenmuth, Mich., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Continuation-in-part of application Ser. No. 55,759, July 17, 1970, now abandoned. This application Sept. 21, 1970, Ser. No. 74,003

Int. Cl. B23b *31/06*

U.S. Cl. 279—91 **22 Claims**

A tool holder includes a hollow supporting member on which there is threaded a locking ring which is urged to its locked position by a spring, there being a combined latch and release pin for holding the locking ring in the unlocked position, and responsive to the reception of a tool adapter to be automatically released for automatically tightening the locking ring. In one embodiment, the spring is a compression spring and includes a spring retainer for keeping the same in the locking ring.

3,663,029

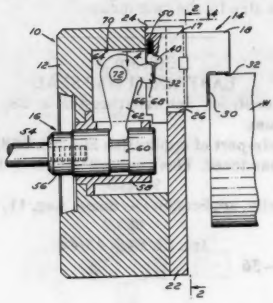
CHUCK JAW LOCKING MECHANISM

William R. Dexter, Royal Oak, Mich., assignor to Verstand Engineering, Inc., Madison Heights, Mich.

Filed Apr. 16, 1970, Ser. No. 29,112

Int. Cl. B23b *31/16*

U.S. Cl. 279—119 **1 Claim**



A rotating chuck having circumferentially spaced jaws and pivoted clamping levers for moving the jaws radially inwardly to clamp a workpiece. A wedge is associated with each jaw to hold the same against outward movement due to centrifugal force. Springs are provided to urge the wedges in a wedging direction. The levers release the wedges when retracting the jaws.

3,663,030

SPACER EXPANDER AND PROCESS OF MANUFACTURE OF SAME

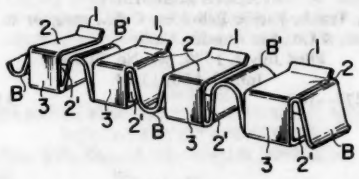
Mikio Miyamoto, Omiya, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed July 13, 1970, Ser. No. 54,279

Claims priority, application Japan, July 12, 1969, 44/54831

Int. Cl. F02f *5/00*; F16j *9/06*

U.S. Cl. 277—140 **1 Claim**



A spacer expander is of U shape in radial cross section and has upper and lower pressure supporting surfaces which have projections for urging side rails radially. Intermediate curved portions extend between adjacent pairs of upper and pairs of lower pressure supporting surfaces for circumferentially connecting the same.

3,663,031

SPORTING APPARATUS

William E. L. Young, 731 S. Remington Rd., Columbus, Ohio

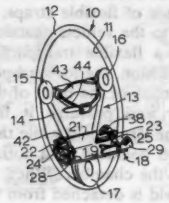
Filed Feb. 25, 1970, Ser. No. 13,907

Int. Cl. A63c *17/08*

U.S. Cl. 280—11.24 **10 Claims**

Unique sporting apparatus comprising skate-like devices attaching not only to the feet but to the legs of the user. Such devices feature a single large diameter wheel which is revolvable relative a bearingly mounted frame embodying a

laterally projecting foot support. On applying a pair of such devices to the feet, the wearer is elevated a significant distance from ground surface and may glide with exciting physical sensations over a variety of ground surface.

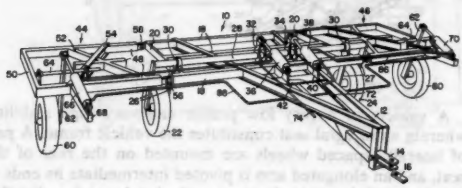


3,663,032

HYDRAULIC DEPTH CONTROL FOR AGRICULTURAL IMPLEMENTS

Richard Wayne Hook, Des Moines, and Virgil Dean Haverdink, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 2, 1970, Ser. No. 85,996
Int. Cl. B62d *21/18*
U.S. Cl. 280—43.23 **22 Claims**



An implement including pivotally interconnected and wheel supported main and outrigger frames which can be raised and lowered on the wheels by a plurality of hydraulic cylinders, there being a single cylinder connected between each outrigger frame and its respective wheel and a pair of cylinders connected between the main frame and its wheels with the single cylinders and one of the pair of cylinders being hydraulically connected in series and the pair of cylinders being hydraulically connected in parallel. By employing the pair of parallel cylinders, lift capacity is increased since one of the pair of cylinders operates to raise the main frame while the other of the pair of parallel cylinders passes fluid pressure onto the single cylinders to raise the outrigger frames.

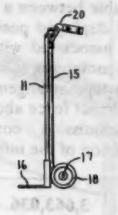
3,663,033

HANDLE ON HAND TRUCK

Thomas Story, Portland, Oreg., assignor to Harco Products, Inc., Portland, Oreg.

Filed Nov. 20, 1970, Ser. No. 91,502
Int. Cl. B62b *5/06*
U.S. Cl. 280—47.27 **4 Claims**

A separate handle part has a jaw portion overlying a cross bar portion of the truck frame. A socket fitting on the upper end of a central upright tubular member of the frame has a jaw portion underlying the cross bar. The two jaw members are clamped on the cross bar by a screw having threaded engagement with a plug in the upper end of the central frame member. The plug and upper end of the central frame member are tapered to fit in a tapered socket in the socket fitting whereby the screw holds all the parts securely together.

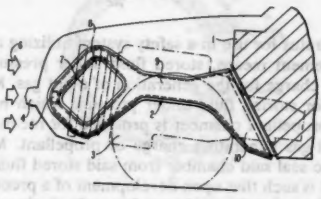


3,663,034

SAFETY FRAME STRUCTURE FOR MOTOR VEHICLES, ESPECIALLY PASSENGER MOTOR VEHICLES

Bela Barenyi, Maichingen; Bruno Sacco, Sindelfingen, and Hermann Renner, Boblingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Oct. 1, 1969, Ser. No. 862,892
Claims priority, application Germany, Oct. 3, 1968, P 18 00 779.9
Int. Cl. B62d *21/00*
U.S. Cl. 280—106 **17 Claims**



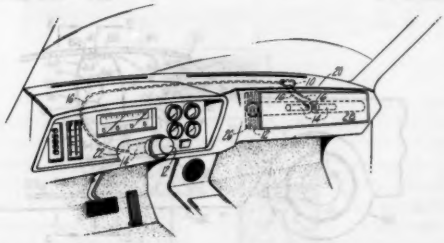
A safety frame structure for motor vehicles in which the outer ends of the longitudinal lateral bearers which extend from a rather form-rigid center section of the vehicle containing the passenger space to corresponding vehicle ends, are constructed as preferably closed loop-shaped parts.

3,663,035

SELF-CONTAINED PASSENGER RESTRAINING SYSTEM

Thomas W. Norton, Simsbury, Conn., assignor to The Ensign-Bickford Company, Simsbury, Conn.

Filed Jan. 27, 1970, Ser. No. 6,111
Int. Cl. B60c *21/10*
U.S. Cl. 280—150 AB **11 Claims**



An inflatable self-contained passenger restraining system independent of the electrical system of the vehicle is pro-

vided for restraining movement of an occupant upon rapid deceleration or impact of the vehicle. The system comprises an inflatable bag movable between a collapsed deflated position and an expanded deployed position, a pyrotechnic gas generator operatively associated with the bag for inflation thereof, the generator containing solid, granular, gas-generating charges in a multistage arrangement. An inertia sensing device responsive to impact force above about 4 g triggers an explosive signal transmission cord for actuating the pyrotechnic gas generation of the inflating gas.

3,663,036

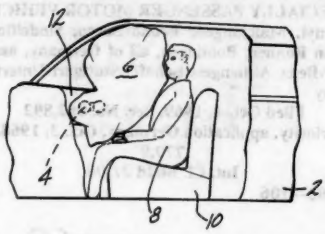
VEHICLE SAFETY DEVICE HAVING AN INFLATABLE CONFINEMENT

James T. Johnson, Herrin, Ill., assignor to Olin Corporation

Filed June 16, 1970, Ser. No. 46,612

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 AB **16 Claims**



An apparatus for use in a safety system utilizing an inflatable confinement means, stored fluid under pressure, and a propellant charge for the generation of a hot gas. Means are provided for storing fluid under pressure which has a fluid outlet. A propellant chamber is provided for receiving an ignitable hot-gas generating charge of propellant. Means are provided to seal said chamber from said stored fluid. The arrangement is such that upon development of a predetermined chamber pressure after ignition of propellant, the chamber is unsealed and the fluid outlet is opened to permit the stored fluid and hot gas from the burning of the propellant to exit through the outlet. Means are provided between the chamber and the fluid outlet to deflect the hot gas upon exit from the chamber in a direction away from the fluid outlet to mix with the fluid prior to exit.

3,663,037

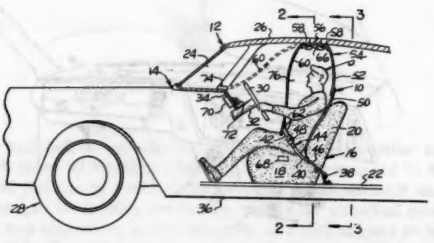
OCCUPANT SAFETY RETAINING DEVICE FOR VEHICLES

Mary Wohn-Machowski, 841 Greendale Drive, Windsor, Ontario, Canada

Filed Jan. 6, 1971, Ser. No. 104,321

Int. Cl. B60r *21/04*

U.S. Cl. 280—150 B **7 Claims**



Detachably connected to the conventional floor-anchored vehicle seat belt is an occupant-retaining device consisting of an inverted U-shaped occupant-retaining shield of flexible transparent material detachably securable at its forward end to the conventional seat belt, anchored at its uppermost portion to the vehicle roof structure, and secured at its rearward end to the upper ends of flexible straps, the lower ends of which are anchored to the vehicle chassis or floor structure. The device creates a flexible transparent-walled chamber wherein, during a collision, the forward portion of the shield retains the upper portion of the body of the occupant within the shield chamber and prevents it from being thrown through or against the windshield while the rearward portion of the shield prevents backlash, and both prevent the occupant's ejection from the chamber. When not in use, the forward end of the shield is detached from the seat belt and is secured to a convenient point on the vehicle body.

3,663,038

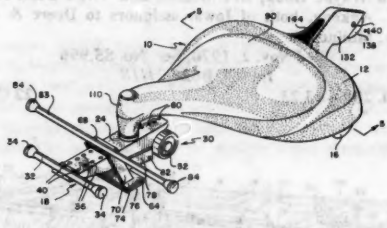
VEHICLE WITH COMBINATION STEERING, BRAKING AND PROPULSION MEANS

William E. Hendricks, Wichita, Kans.

Filed Apr. 6, 1970, Ser. No. 25,762

Int. Cl. B62m *29/00*

U.S. Cl. 280—218 **38 Claims**



A vehicle of a very low profile and very high stability, wherein an integral seat constitutes the vehicle frame. A pair of laterally spaced wheels are mounted on the rear of the seat, and an elongated arm is pivoted intermediate its ends to the front of the seat about a vertical axis, and a dirigible wheel is mounted on the arm rearwardly of the vertical axis. A footrest is secured to the arm forwardly of the vertical axis, whereby a rider can swing the arm to steer the vehicle and also cause propulsion thereof. A brake is pivotally mounted on the arm, with handle actuating means being provided therefor which can be employed to control the brakes and/or swinging movement of the arm. Alternate movement of the arms, legs, and body to the right and left of the desired steering direction coupled with twisting movement of the body results in effecting propulsion of the vehicle in a manner somewhat analogous to the propulsion of a boat by a sculling oar. One version of the vehicle includes a single U-shaped bar to constitute a footrest and handles, and this version includes provision for releasably latching the brake from its breaking condition.

3,663,039

CONVERTER LOCK BAR

Charles W. Morgan, Albuquerque, N. Mex., assignor to M M & W., Inc.

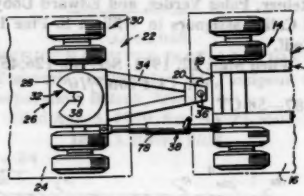
Filed Oct. 24, 1969, Ser. No. 869,055

Int. Cl. B62d *53/00*

U.S. Cl. 280—408 **7 Claims**

A telescoping arm assembly for connection between the rear end of a vehicle and a wheeled dolly trailed behind the vehicle. The arm assembly may be secured in predetermined extended position to prevent angular displacement of the dolly about an upstanding axis relative to the vehicle while the vehicle is being backed and the telescoping arm assembly may be subsequently released for ready telescoping during turning movement of the vehicle relative to the dolly or

disconnected from the vehicle and supported from the dolly

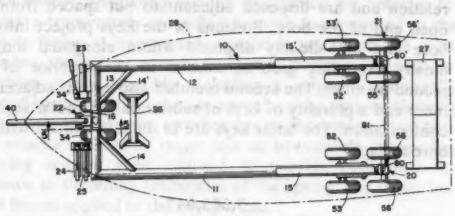


when the vehicle is to be moved in a forward direction and trailed as a trailer.

3,663,040
SMALL BOAT CARRIER

Chester H. Weaver, 184 Kingston Park Road, Baltimore, Md., and Charles C. Hoffberger, Apt. 59, 200 Cross Keys Rd., Baltimore, Md.

Filed June 18, 1970, Ser. No. 47,183
Int. Cl. B62d *53/00*
U.S. Cl. 280—414 R **7 Claims**



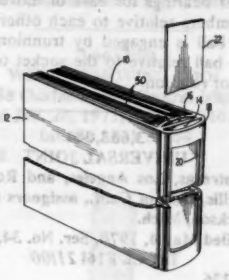
The invention is a small boat carrier or straddle-type trailer for boat yard use. The carrier is characterized by a single unitary open-ended horizontal U-frame which rides upon a pair of independent opposing multiple wheeled truck units disposed beneath the port and starboard after ends of the U-frame. The forward or closed end of the U-frame rides upon a free-wheeling swivel-mounted dolly unit which can be coupled to a tow truck or small tractor. The U-frame can be raised or lowered by one or more hydraulic rams which comprise extensible frame supporting means interposed between the truck units and the superjacent U-frame. Being devoid of load-bearing cross-members, the U-frame alone constitutes the sole structure which supports the hull of the boat to be moved. To operate, the carrier is backed into position beneath a boat and straddling the fixed support upon which the boat rests. The U-frame is hydraulically elevated to lift the boat clear of the fixed support, and the entire assembly is then ready for towing to another location.

3,663,041
BINDER

James C. White, P. O. Box 5495, Station B, Greenville, S.C.

Filed Mar. 16, 1970, Ser. No. 19,922
Int. Cl. B42f *11/02*
U.S. Cl. 281—46 **3 Claims**

A binder for magazines and the like is extruded from plastic material to include a spine assembly including a main spine strip and at least a bowed inner anchoring strip joined to the spine strip. An outer bowed strip may also be formed opposite the anchoring strip, the outer strip having a window, or outer flanges may be formed along the opposite edges of the anchoring strip, the window or the flanges receiving identification strips. Resilient wire retaining elements are

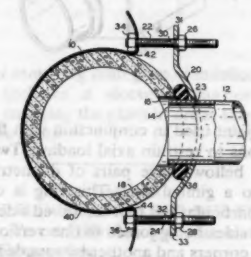


hooked over the upper and lower edges of the anchoring strip to secure a magazine or the like within the binder.

3,663,042
SEWER TAP

Dwight W. Fowler, 705 S.W. 206th St., Aloha, Oreg.

Filed Apr. 22, 1970, Ser. No. 30,766
Int. Cl. F16l *41/00*
U.S. Cl. 285—199 **11 Claims**

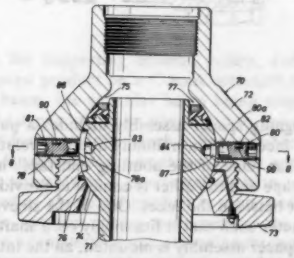


A sewer tap for a main sewer line includes a branch pipe extending into a drilled aperture in the sewer line through an annular clamping plate disposed in spaced relation to the side of the sewer line. An O-ring seal is located between the clamping plate and the side of the sewer line, while a pair of studs provided at ends of a cable passing around the sewer line are engaged by nuts for tightening the clamping plate against the O-ring seal.

3,663,043
BALL AND SOCKET JOINT FOR PIPELINES

George W. Walton, 8903 Devonshire Drive, Dallas, Tex.

Continuation-in-part of application Ser. No. 861,399, Sept. 26, 1969, now abandoned. This application Jan. 2, 1970, Ser. No. 128
Int. Cl. F16l *17/00*
U.S. Cl. 285—113 **14 Claims**



A ball and socket joint is disclosed that has a pressure energized seal that can seal against pressure differentials in

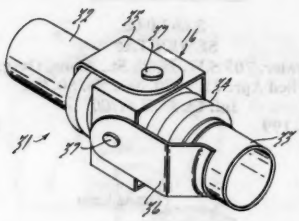
either direction. In one embodiment, the ball portion is supported on roller bearings for ease of movement of the ball and socket members relative to each other. In another embodiment, the ball is engaged by trunnions that allow the rotation of the ball relative to the socket to be limited to a variety of axes or rotation.

3,663,044

UNIVERSAL JOINT

Gilbert E. Contreras, Los Angeles, and Robert W. Graves, Woodland Hills, both of Calif., assignors to Aeroquip Corporation, Jackson, Mich.

Filed May 4, 1970, Ser. No. 34,160
Int. Cl. F16l 21/00
U.S. Cl. 285—226 8 Claims



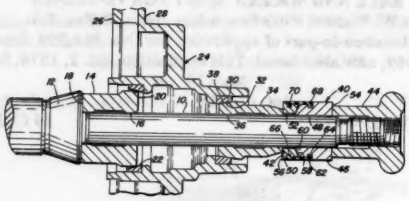
A universal joint used in conjunction with flexible bellows duct connections to restrain axial loading. Two sleeves connected by the bellows have pairs of diametrically opposed lugs pivoted to a gimbal ring. This ring is of non-circular shape, and in particular has four uncurved sides connected to the lugs, these sides being joined in one version of the invention by square corners and another by rounded corners.

3,663,045

SPACER ASSEMBLY

Wallace F. Mitchell, Arlington Heights, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Filed Aug. 24, 1970, Ser. No. 66,530
Int. Cl. F16d 1/06
U.S. Cl. 287—52.07 5 Claims



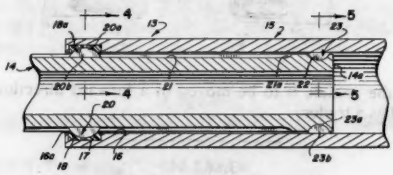
A self-aligning spacer assembly includes a pair of sleeves having end faces held in mutually abutting relationship by a resilient collar. One of the abutting end faces has a convex spherical shape and the other is conical to provide substantial line contact between the faces. One of the sleeves has an internal diameter such that it fits snugly on a shaft or arbor on which the spacer assembly is mounted, an the internal diameter of the other sleeve is slightly greater so that it can rock on the arbor to a limited extent relative to the other sleeve.

3,663,046

LOAD DISTRIBUTION AND ANTI-ROTATION MECHANISM

Thomas Reiner, Palos Verdes, and Edward Dobyns, Valinda, both of Calif., assignors to William S. Pine Inc., Los Angeles, Calif.

Filed Mar. 22, 1971, Ser. No. 126,453
Int. Cl. F16b 7/10
U.S. Cl. 287—58 CT 9 Claims



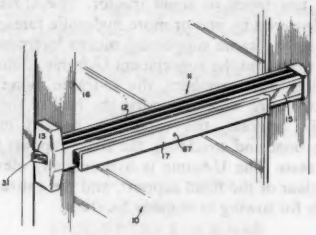
A load distribution and anti-rotation mechanism is provided which is adapted to withstand heavy and repeated transverse loads applied thereto. The mechanism includes first and second members arranged in telescoping relation. The first member is provided with an elongated bore in which the second member is slidably disposed. The bore surface carries a plurality of keys of substantially circular segment configuration which are arranged in angularly spaced relation and are disposed adjacent to but spaced from the open end of the bore. Portions of the keys project into the bore and are slidably disposed within elongated longitudinally extending grooves formed in the exterior of the second member. The second member also carries adjacent its inner end a plurality of keys of substantially circular segment configuration. The latter keys are in slidable contact with the bore surface.

3,663,047

RIGHT-LINE MOVEMENT PANIC EXIT DEVICE

George Z. Zawadzki, Indianpolis, Ind., assignor to Von Duprin, Inc., Indianapolis, Ind.

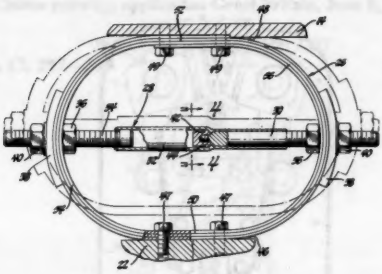
Continuation-in-part of application Ser. No. 32,971, Apr. 29, 1970, now abandoned. This application Aug. 5, 1970, Ser. No. 61,110
Int. Cl. E05c 3/16
U.S. Cl. 292—92 21 Claims



A latch and actuator assembly, primarily intended for use as a panic exit device, in which a push bar substantially spanning the width of a hinged closure is mounted for bodily rectilinear movement in the closure-opening direction and perpendicularly toward the closure, one or more toggle-like linkages being interposed between the push bar and an actuator, mounted for movement transversely of the closure and operatively connected to a movable latch bolt, the actuator being biased toward bolt-projected position and being moved to bolt-retracted position by the elongation of the toggle-like linkages upon such movement of the push bar. In one form of the invention, the apices of two such toggle-like linkages are joined by a rigid stretcher; while in another and preferred

form, a guide lip engages the roller at the apex of each toggle to confine that roller in contact with the inner surface of the push bar.

3,663,048
VEHICLE BUMPER INSTALLATION
Wilbur J. Zimmerle, Bellbrook, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 3, 1970, Ser. No. 25,360
Int. Cl. B60r *19/08*
U.S. Cl. 293—84 **3 Claims**

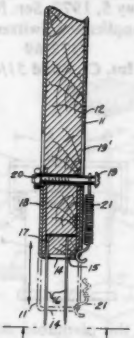


An energy dissipating bumper installation for vehicles includes a transversely extending bumper bar mounted to the vehicle frame at transversely spaced locations on the cross member thereof by energy dissipating bumper mounted assemblies, each assembly including a generally elliptically shaped spring unit attached at opposite sides thereof along its minor axis to the cross member and to the bumper and having attached across its major axis an irreversible energy dissipating tension strut adapted to provide controlled resistance to flattening tendencies of the spring unit under impact forces applied to the bumper bar.

3,663,049
GOLF BALL RETRIEVAL AND STORAGE DEVICE
Clifford Neil James, 300 West Bagley Rd., Berea, Ohio
Filed Aug. 25, 1970, Ser. No. 66,685
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 A **5 Claims**

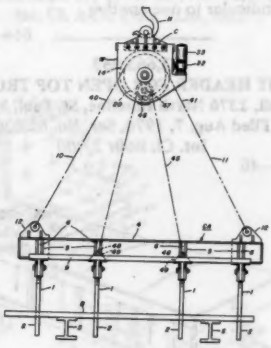
An improved golf ball retrieval and storage device comprised of an elongated handle, a rigid loop mounted at one end of the handle, a bag mounted on the loop, the bag having a narrow open mouth mounted on and held open by the rigid loop, the bag also having an enlarged storage portion and a restricted neck between the mouth and enlarged storage portion, an arm rest provided on the upper end of the elongated handle, the handle being detachable and in sections small enough to fit into the bag, the rigid loop being stirrup-shaped with the flat side locating opposite the loop's connection to the elongated handle, the flat side of the loop having a length several times the diameter of a U.S. golf ball.

3,663,050
WEED REMOVING TOOL
Alfred Fuchs, 238 Oakland Ave., Central Islip, N.Y.
Filed Jan. 28, 1971, Ser. No. 110,411
Int. Cl. A01k *81/04*
U.S. Cl. 294—50 **1 Claim**



A device for removing crab grass, dandelions, and the like. This device includes a sleeve having prongs extended therefrom for engaging the plant in order to pull it out of the ground with the roots.

3,663,051
C-HOOK LEVELING DEVICE FOR BILLET HANDLING
Quin Shen Yu, Forest Hills Borough, Pa., assignor to United States Steel Corporation
Filed Oct. 14, 1970, Ser. No. 80,542
Int. Cl. B66c *1/16*
U.S. Cl. 294—67 A **3 Claims**



A winch for supporting blooms, billets, rod, pipe, and other elongated product on a C-hook assembly that includes a spreader beam, the spreader beam being suspended from the winch by a pair of cables connected to opposite ends of the spreader beam, and the winch being operable to inversely change the lengths of the suspension cables and thus move the C-hook assembly to a horizontal position when an unbalanced load of elongated product is supported thereon. A second cable restrains tilting movement of the C-hook assembly about a longitudinal axis extending through the points at which the suspension cables are connected to the spreader beam, the second cable having a turnbuckle for adjusting its

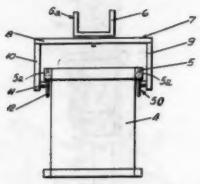
length, and being trained over a sheave rotatably supported on a housing for the winch with its axis parallel to the winch axis.

3,663,052

APPARATUS FOR PIVOTABLY MOUNTING A LOAD CONTAINER AT A TRAVELLING CARRIAGE OF OVERHEAD CONVEYORS OR THE LIKE

Eugen Schurch, Gerlafingen, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed May 5, 1970, Ser. No. 34,757
Claims priority, application Switzerland, May 9, 1959, 7172/69
Int. Cl. B65d *51/00*
U.S. Cl. 294—73 **9 Claims**



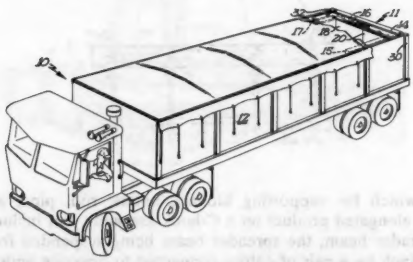
An apparatus for the pivotable mounting of a load container at a travelling carriage or similar mechanism of overhead conveyors or the like such that the load container always is suspended vertically or perpendicularly independent of the position of the travelling carriage. The inventive apparatus embodies two support holders arranged at the load container and two swivel or hinge joint devices arranged at the suspension mechanism of the travelling carriage. Each swivel or hinge joint mechanism embodies at least two components which are rotatable relative to one another, wherein one component is fixed with the suspension mechanism of the traveling carriage and the other free component is at least partially enclosed by the associated support holder. These components of each swivel joint mechanism and the associated support holder are constructed in such a way that the suspended load container is centered with respect to the suspension mechanism in two directions which are approximately perpendicular to one another.

3,663,053

SPLIT HEADER FOR OPEN TOP TRUCKS

Andrew Ambli, 2376 North Hamline, St. Paul, Minn.

Filed Aug. 7, 1970, Ser. No. 62,026
Int. Cl. B60r *27/00*
U.S. Cl. 296—40 **3 Claims**



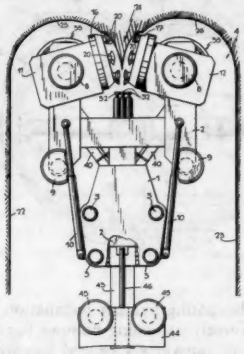
A split header assembly to enable a man standing on the floor of a truck to draw inward and interconnect the upper rear sides of a high open top truck so the truck's rear doors can be closed, aligned, and locked. A latch mechanism mounted on two header sections which are swingably mounted to the rear corner posts of the truck sides, has a lever arranged for upward and downward swinging movement. The lever moves a pair of latch bars on one header section into and out of locking engagement with a pair of keepers on the other header section to draw the header sections inward and retain them.

3,663,054

MACHINE FOR DIGGING UNDERGROUND GALLERIES

Michel A. Dubois, 70, rue Hamoir, La Louviere, Belgium

Filed Mar. 24, 1970, Ser. No. 22,287
Claims priority, application Great Britain, Mar. 25, 1969, 15,687/69
Int. Cl. E01g *3/04*; E21c *29/02*
U.S. Cl. 299—18 **12 Claims**



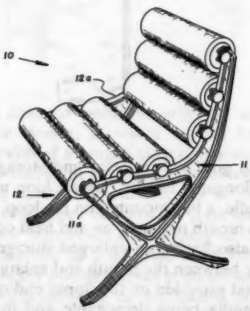
The invention relates to a machine for digging underground galleries. This machine comprises a framework displaceable in the gallery, at least a pair of homologous arms connected to this framework and adapted for swinging movements respectively about two substantially parallel axis, a toolholder on each arm and cutting tools on each toolholder, adapted to cut through a cutting face of the gallery. In this machine, each arm and the position of the latter of its toolholder are adapted for a swinging movement of this arm greater than 90° from a position in which the said arm is directed towards a lateral wall of the gallery, as far as a position in which the arm is directed towards the other lateral wall, while passing through a position in which the arm is parallel to the gallery's axial plane, the cutting tools passing continuously along the cutting face of the gallery.

3,663,055

CHAIR WITH ADJUSTABLE SEATING PORTIONS

John A. Gale, Wayzata, Minn., assignor to Monsanto Company, St. Louis, Mo.

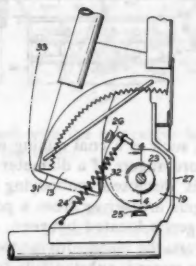
Filed July 10, 1970, Ser. No. 53,908
Int. Cl. A47c *7/00*
U.S. Cl. 297—283 **10 Claims**



A chair or similar article of seating furniture having a pair of side members which provide the vertical support elements

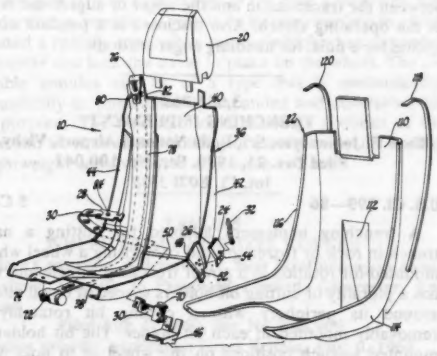
for the article and which are provided with slat receiving elements on the upper or seat defining portions thereof and a plurality of slat elements to extend transversely between the side members providing the transverse support for the article and the slats being positionable within the receiving elements to provide an adjustable occupant receiving area.

3,663,056
VEHICLE SEAT FRAMES AND MECHANISMS
Harold Roy Turner, Walsall, England, assignor to H. R. Turner (Willenhall) Limited, Walsall, England
Filed Sept. 2, 1969, Ser. No. 854,619
Claims priority, application Great Britain, June 8, 1968, 27,360/68
Int. Cl. A47c *3/00*; B60n *1/02*
U.S. Cl. 297—369 **5 Claims**



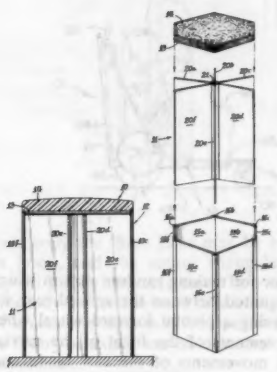
The invention provides a mechanism for adjusting the angle of the seat back to the seat base in which toothed members are provided on parts secured to the seat back and seat base at both sides of the seat, and in disengaging the teeth for angular adjustment one plate at each side is lifted bodily with respect to the other plate at each side to take the teeth out of mesh.

3,663,057
VEHICLE SEAT HAVING RESTRAINT SYSTEM WITHIN TRIM
Thomas E. Lohr, Warren, and Robert L. Stephenson, Sterling Heights, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.
Filed Jan. 19, 1970, Ser. No. 3,815
Int. Cl. A62b *35/00*
U.S. Cl. 297—388 **1 Claim**



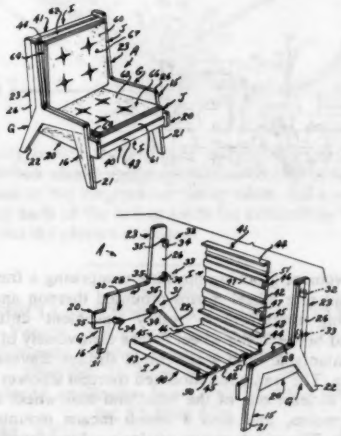
A self-contained seat and restraint system including a semirigid seat shell having a channel about the rear and sides thereof, a fixed, beltless buckle in one side of the channel, and a retractable lap belt guided through and by the other side of the channel. A shoulder belt system is also carried by the shell. The shell is trimmed both front and back to fully enclose both the shell and the restraint system mounted thereon.

3,663,058
COLLAPSIBLE STOOL
Irving C. Hirsch, 4212 W. Golf, Skokie, Ill.
Filed Aug. 6, 1970, Ser. No. 61,579
Int. Cl. A47c *9/12, 3/00*
U.S. Cl. 297—439 **3 Claims**



A collapsible stool is disclosed including an outer side wall which is expandable to form a shell for receiving a central brace in the form of a number of leaves bound together along a central line. A cushion fits into an upper recess. When collapsed, the three members are compact and easily carried.

3,663,059
FURNITURE CONSTRUCTION
Donald E. Omlie, 8698 E. Robinwood Cr., Utica, Mich.
Filed Sept. 23, 1970, Ser. No. 74,630
Int. Cl. A47c *7/00, 7/20, 4/02*
U.S. Cl. 297—440 **2 Claims**



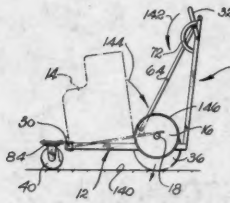
An article of furniture having a pair of end sections, cushion support means removably mounted between said end sections and supporting the end sections in a spaced-apart

relation, and cushion means removably received by the cushion support means.

3,663,060
WHEELED SAW

Donald G. Shatwell, Wilmington, and Lester F. Kuzmick, Palos Verdes Estates, both of Calif., assignors to Cushion Cut, Inc.

Filed Mar. 4, 1970, Ser. No. 16,424
Int. Cl. E01c *23/09*
U.S. Cl. 299—39 **9 Claims**

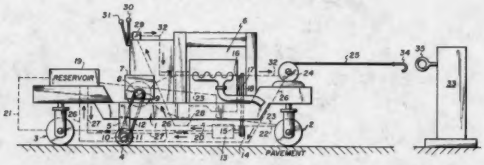


A wheeled saw for making random cuts in which a rotary saw blade is mounted between the spaced rear wheels of a carriage and having a pivotal forward wheel whereby relatively large movements of the front of the carriage effects relatively small movements of the saw blade enabling the blade to follow random cracks such as would appear in concrete and asphalt. An engine for operating the saw blade is mounted on the carriage and is vertically movable to raise or lower the saw blade from or to a cutting position and to bear on the blade when it is in a cutting position.

3,663,061
PAVEMENT GROOVING MACHINE WITH HYDRAULIC WINCH

Harold C. Miller, Chicago, Ill., assignor to Super-Cut Inc., Chicago, Ill.

Filed Nov. 2, 1970, Ser. No. 85,991
Int. Cl. E01c *23/09*; E21c *29/10*
U.S. Cl. 299—39 **3 Claims**

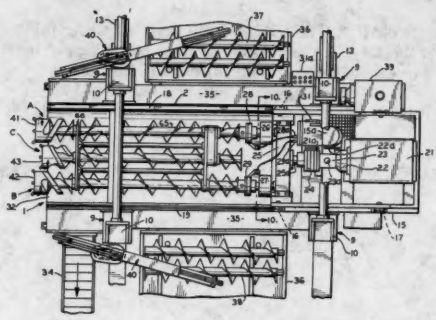


A pavement grooving machine comprising a frame having front and rear wheel means mounted thereon and carrying depending therefrom a rotary pavement cutter means mounted between the wheel means transversely of the frame and contactable with a pavement surface traversed by the machine. The frame has mounted thereon a power means for driving at least one of the front and rear wheel means, the cutter means, and also a winch means mounted on the machine. The winch means carries a cable connectable to an anchor means located forwardly of the machine whereby the machine is capable of being both self-propelled and towed along the pavement surface while the pavement is being grooved by the rotary cutter means.

3,663,062
DRIVE FOR PLURAL AUGER MINING MACHINE

William G. Young, and Frederick G. Horning, both of Salem, Ohio, assignors to The Salem Tool Company, Salem, Ohio

Filed Aug. 20, 1969, Ser. No. 851,696
Int. Cl. E21c *27/22, 35/20*
U.S. Cl. 299—57 **35 Claims**



Auger apparatus, such as a coal mining machine, adapted to utilize one or more augers of a diameter falling in a wide range. Apparatus is disclosed embodying three augers in which two side augers are driven from a power source, and an intermediate auger is located between, and driven from one of, the side augers; the means driving the side auger driving the intermediate auger is substantially free of the load of conveying mined material cut by the cutting head of the intermediate auger but has the load of driving two augers while the other side auger is free of the load of driving the intermediate auger but has substantially all of the load of conveying material cut by the cutting heads of such side auger and the intermediate auger. Apparatus is also disclosed having a cutting head assembly comprising three or more augers and longitudinal tie bars extending between adjacent augers and fixed to cross members rotatably supporting the cutting heads, to provide a rigid assembly. Also disclosed is apparatus having a main gearbox connected to adjustable or removable auxiliary gearboxes, so that the apparatus can be adapted to drive one or more augers from a main gearbox. Preferably, the auger power system embodies two clutches the first of which, preferably a mechanical clutch, is located between the engine and the transmission and is used to disconnect the transmission from the engine to permit shifting of transmission gears, and the other of which clutches, a non-mechanical clutch such as an air clutch, is located between the transmission and the auger or augers and is used as the operating clutch. Also disclosed is a pendant control system for a hoist for handling auger sections.

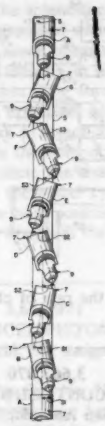
3,663,063
TRENCHING IMPLEMENT

Hillard E. Johnmeyer, Sr., Rolla National Airport, Vichy, Mo.

Filed Dec. 21, 1970, Ser. No. 100,041
Int. Cl. E02f *5/08*
U.S. Cl. 299—86 **5 Claims**

A trenching implement adapted for cutting a narrow trench in rock or frozen ground comprising a wheel which is mounted for rotation in a power trenching vehicle and which has a plurality of cutting bit holders spaced at equal intervals around its periphery with a cutting bit rotatably and removably mounted in each bit holder. The bit holders are mounted in such positions on the wheel as to hold all the cutting bits at the same positive rake angle, certain of the bit holders holding the respective cutting bits in the plane of the wheel, others holding the respective bits at skew angles with respect to the plane of the wheel with the respective bits extending out at one side of the wheel, and other holders hold-

ing their respective bits at skew angles with respect to the

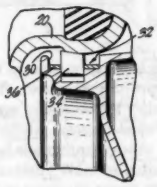


plane of the wheel with the respective bits extending out at the other side of the wheel.

3,663,064
WHEEL COVER

Raymond A. McCarroll, Grosse Pointe, Mich., assignor to Acme Precision Products, Inc., Detroit, Mich.

Filed Jan. 27, 1970, Ser. No. 6,263
Int. Cl. B60b *7/06*
U.S. Cl. 301—37 R **11 Claims**



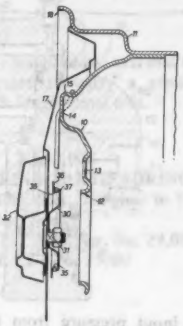
A vehicle wheel cover disposed over the side of a wheel having a drop center type rim, said cover including a disc portion with an axially inwardly extending annular flange that is telescoped into an axial flange of the drop center rim. The annular flange contains a groove in its outer surface in which is seated a radially expansible annulus which when expanded will center and lock the cover in place on the wheel. The expansible annulus can be of a type that is mechanically, hydraulically or pneumatically expanded and contracted for this purpose. The disc and annular flange portions of the cover can be formed by molding of plastic or by die casting of lightweight metals such as aluminum and zinc.

3,663,065
WHEEL TRIMS OR WHEEL COVERS

Geoffrey Crompton, Alderminster, near Stratford-upon-Avon, England, assignor to Pressweld Limited, Gloucester, England

Filed Aug. 1, 1969, Ser. No. 846,906
Claims priority, application Great Britain, Aug. 6, 1968, 37,532/68; Nov. 1, 1968, 51,779/68
Int. Cl. B60b *7/06*
U.S. Cl. 301—37 R **7 Claims**

A detachable wheel trim for a vehicle wheel, having anchorage hooks for attachment to the wheel, operable from the external side of the trim. In one form three anchorage hooks are connected to a triangular arrangement of three resilient steel links fitting over a triangular cam connected to a rotary knob on the external surface of the trim, so that by rotating the knob and the cam the three links are bent outwardly to cause a resilient inward force to be applied to each

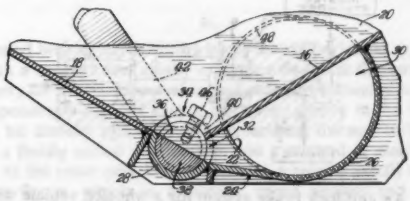


hook, alternatively the three links may be combined into a continuous hoop, and the rotary triangular cam may be replaced by an axially movable cam. Two or more pairs of parallel links may be used instead of a triangular system and in place of a cam the links may be operated by levers connected to a rotary or axially movable central shaft connected to the external knob.

3,663,066
HOPPER DISCHARGE ASSEMBLY

Robert T. Fischer, Harvey, and Byron W. Martin, Kanakakee, both of Ill., assignors to Miner Enterprises Inc., Chicago, Ill.

Filed Jan. 19, 1970, Ser. No. 3,672
Int. Cl. B65g *53/46*
U.S. Cl. 302—42 **5 Claims**



A housing having inclined side walls and a pair of end walls, a plenum chamber adjacent the lower end of the housing with one or two longitudinal lading inlets, and a rotatable valve along each of the lading inlets for controlling the flow of lading into the plenum chamber.

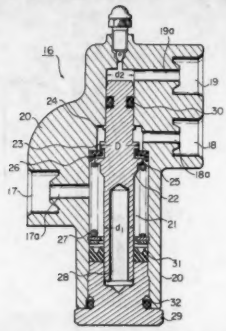
3,663,067
VEHICULAR HYDRAULIC BRAKE SYSTEM

Kelichiro Yabuta, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 18, 1970, Ser. No. 12,280
Claims priority, application Japan, Feb. 22, 1969, 44/12911
Int. Cl. B60t *8/26*
U.S. Cl. 303—6 C **3 Claims**

A vehicular hydraulic brake system of tandem type having split master cylinders connected, for instance, to the front and rear brake units through independent fluid circuits, which system has a fluid pressure modulator valve con-

structed to transmit an unmodulated fluid pressure to the brake cylinder when a fluid pressure built up in the master cylinders is lower than a predetermined level and to transmit a modulated fluid pressure to the rear brake cylinders when the fluid pressure in the master cylinders exceeds the predetermined level, the modulated pressure being proportional to the input pressure from the rear brake master cylinder. In the event a failure takes place in the front brake fluid circuit, the valve transmits to the rear brake cylinders either an unmodulated fluid pressure or a pressure which is modulated to be higher than the fluid pressure modulated when the input fluid pressure is higher than the above mentioned predetermined level.



3,663,068

ANTI-LOCK BRAKE SYSTEMS

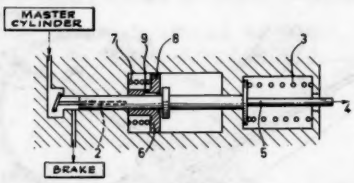
Denis Sharp, Sussex, England, assignor to U.S. Philips Corporation, N.Y., N.Y.

Continuation of application Ser. No. 771,591, Oct. 29, 1968, now abandoned. This application Dec. 14, 1970, Ser. No. 98,159

Claims priority, application Great Britain, Nov. 1, 1967, 49,705/67

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 F **6 Claims**



An anti-lock brake system for a wheeled vehicle which includes a control element for varying brake pressure and a damper piston arranged in a fluid cavity and coacting with the control element for regulating the movement of the control element during the anti-lock cycle. The dampened motion of the control element will effectuate a rapid initial and more gradual final rate of re-application of the brake pressure.

3,663,069

SKID CONTROL SYSTEM

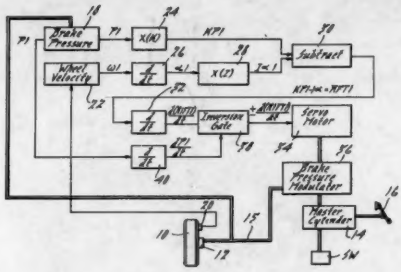
Charles C. Perry, Ann Arbor, and Andre L. De Villiers, Whitmore Lake, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Continuation of application Ser. No. 769,033, Oct. 21, 1968, now abandoned. This application Oct. 7, 1970, Ser. No. 78,994

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 P **16 Claims**

A skid control system in which the retarding force on the vehicle is maximized as a function of one characteristic of the brake pressure and includes apparatus for sensing the magnitude and sign of the rate of change of the brake pressure.



3,663,070

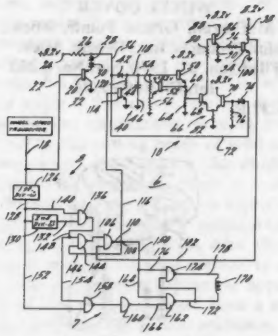
SKID CONTROL SYSTEM

Ronald S. Scharlack, San Antonio, Tex., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Nov. 10, 1969, Ser. No. 875,412

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 P **13 Claims**



A control system and force motor assembly for controlling the skidding of a vehicle under braked conditions when the control system provides a signal for controlling the position of an armature or fluid pressure controlling device in one of three conditions; the first condition being the "dump" mode of operation when the force motor is controlled to preclude braking pressure from being supplied to the wheels of the vehicle, the "hold" mode of operation when the braking force presented at the time the system goes into the "hold" mode of operation is maintained, and the "return" mode of operation when full applied braking pressure is returned to the vehicle wheels.

The control system is effectively responsive to a critical slip signal, the signal being generated in response to a sensed difference between a hypothetical vehicle deceleration, as approximated by a decreasing ramp signal, and the vehicle wheel speed. This comparison is made on a differential basis to provide an output signal which is utilized in controlling an output gate. The gate is also responsive to the sensing of a positive wheel acceleration signal and a change in sign of the rate of change of wheel acceleration. The signal from the output gate is fed to an output logic circuit, the output logic circuit also being rendered responsive to the first derivative of the wheel velocity signal and a combination of first and second derivative of the wheel velocity signal.

The output signals are utilized in the output logic circuit to generate one of three signal conditions across the solenoid

coil of the force motor actuator assembly. In the return mode of operation, the polarity of the output signals generated across the solenoid coil are of the same polarity to cause zero current to flow through the solenoid coil. In the dump mode of operation, the coil is provided with current flow in a first direction and in the hold mode of operation the solenoid coil is supplied with current flowing in a second direction opposite to the first direction. The force motor is fabricated with a three positioned armature which is adapted to be placed either in the return or deactuated position, where no signals are provided from the control circuit; a dump mode of operation which connects the manually actuated brake cylinder hydraulically to the wheel cylinders to provide full braking pressure; and the hold position which maintains the pressure being fed to the wheels at the time the hold position is achieved.

3,663,071

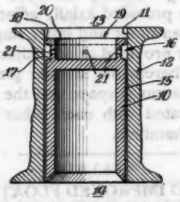
PRESSURE-BALANCED PISTON AND THE LIKE

Willard A. Kates, Deerfield, Ill., assignor to The W. A. Kates Company

Continuation of application Ser. No. 771,551, Oct. 29, 1968, now abandoned. This application Apr. 23, 1971, Ser. No. 137,010

Int. Cl. F16c *1/24, 33/10*

U.S. Cl. 308—5 **13 Claims**



A pressure-balanced system wherein a cylindrical member such as a piston, a shaft, or the like, is movably received in a cylinder bore. Means are provided for balancing the cylindrical member so as to reduce friction between the cylindrical member and the wall of the cylinder bore as may result from a flow of fluid under pressure from an adjacent high-pressure space to an adjacent low-pressure space through the cylinder bore. The balancing means illustratively comprises an annular groove opening to the clearance space between the cylindrical member and the wall of the cylinder bore. In one form, the annular groove is disposed in the cylinder. In another form, the annular groove is disposed in the wall of the cylinder bore. The balancing means may be provided at the end of the clearance space adjacent the high-pressure space, the low-pressure space, or both as desired. Means are provided for causing direct communication between the annular groove and the adjacent pressure space. The communication means illustratively comprises passages in the member in which the annular groove is provided. The illustrated passages comprise bores or laterally opening grooves.

3,663,072

BEARING ASSEMBLY AND MACHINE USING SAME

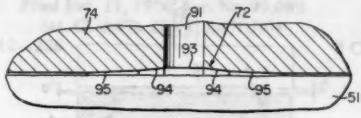
Daniel S. Cvacho, Chesterfield, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed July 24, 1969, Ser. No. 844,523

Int. Cl. F16c *33/10*

U.S. Cl. 308—5 R **9 Claims**

A substantially annular volume is provided between a pair of structures which are relatively movable along a longitudinal axis with one of the structures having an annular groove defining an enlargement in the annular volume. Fluid under pressure is supplied directly to the enlargement so that upon relatively axially moving the structures additional fluid from the enlargement is urged toward the annular volume to perform a wedging action which precisely centers one of the



structures relative to the longitudinal axis and simultaneously enables the one structure to carry a greater load in a direction transverse such longitudinal axis.

3,663,073

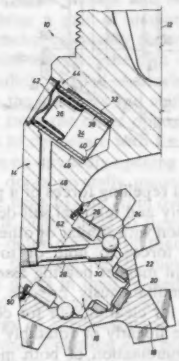
SEALED BEARING EARTH BORING BIT

Charles L. Bronson, Dallas, Tex., assignor to Varel Manufacturing Company, Dallas, Tex.

Filed Apr. 16, 1970, Ser. No. 29,009

Int. Cl. F16c *19/00*

U.S. Cl. 308—8.2 **36 Claims**



A sealed bearing earth boring bit of the rolling cutter type in which a tapered first axially extending flange at the inner periphery of the annular seal is wedged in and bonded to a correspondingly tapered axially extending groove in the leg of the bit thereby positively fixedly securing the seal to the leg in a fluidly sealed relationship, and a method of making same. At the outer periphery of the seal, a second axially extending flange, which is resiliently urged against and in fluidly sealed engagement with the cutter, is provided with a plurality of radially extending cavities in fluid communication with the lubricant proximate the bearings to promote circulation of the lubricant, enchance cooling, and reduce friction and resulting wear of both the seal face and the mating surface of the cutter.

3,663,074

ARRANGEMENT IN SPIRAL GROOVE BEARINGS

Lars Martin Ingemar Fernlund, Hindas, and Erik Magnus Kellstrom, Partille, both of Sweden, assignors to SKF Industrial Trading and Development Company N.V., Amsterdam, Netherlands

Filed May 27, 1970, Ser. No. 40,969

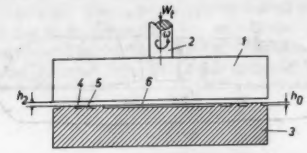
Claims priority, application Sweden, May 27, 1969, 7407/69

Int. Cl. F16c *17/04*

U.S. Cl. 308—9 **1 Claim**

A bearing system lubricated with oil has been developed to carry heavy axial loads at high speeds on vertical spindles. At low speeds the spindle is supported by a ball bearing,

whereas the axial load is taken over by a flat spiral groove bearing when the speed exceeds a predetermined value



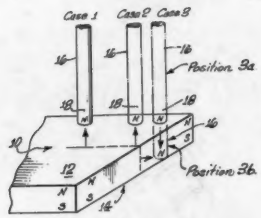
wherein the spiral groove bearing is given an optimum groove pattern by way of analysis.

3,663,075

SELF-CENTERING PERMANENT MAGNET BEARING

Klaus J. Kronenberg, Claremont, Calif., assignor to General Dynamics Corporation

Filed Feb. 18, 1971, Ser. No. 116,355
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 **24 Claims**



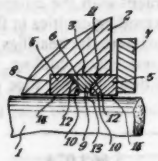
The attracting and repelling forces of a permanent magnet having high coercivity and minimal self-demagnetization are utilized in combination with similar or other types of magnets to provide holding forces to hold or to assist in holding together a permanent magnet bearing assembly utilizing the magnets and to simultaneously provide spacing functions within the assembly for clearance or for centering purposes. The magnets may be linearly or rotatably moved relative to one another or a combination of both movements may be used.

3,663,076

GLAND SEAL ASSEMBLIES

Peter Reginald Valente, London, England, assignor to Hallite Holdings Limited, Middlesex, England

Filed Mar. 9, 1971, Ser. No. 122,474
Claims priority, application Great Britain, Apr. 1, 1970, 1,543,670/70
Int. Cl. F16c *33/78*; F16j *15/24*
U.S. Cl. 308—36.1 **10 Claims**



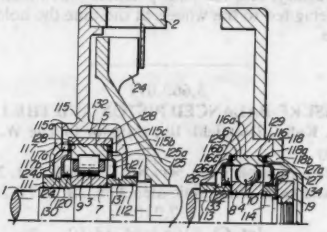
A gland seal assembly is made up of three rings arranged side-by-side. The two outer rings are hard but the intermediate one is elastomeric. At one radial periphery (either inner or outer) the rings have abutting planar faces so that axial moving together of the hard rings compresses part of the intermediate ring between them. This part, bounded by the planar faces, is, in its uncompressed state, of a peripheral radius different from that of the hard rings so that it is set back from them but when axial compression is applied to it it is squeezed so that it projects radially and effects the desired sealing effect. This part of the intermediate ring is narrower then the remainder of the ring so that the peripheral radius of the remainder part is less affected by the compression.

3,663,077

BALL OR ROLLER BEARING ASSEMBLY

Toshio Nakamura; Hidetoshi Arii; Shozo Tatekawa, and Sadaharu Kawai, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of application Ser. No. 795,226, Jan. 30, 1969, now abandoned. This application Apr. 22, 1971, Ser. No. 136,549
Int. Cl. F16c *33/66*
U.S. Cl. 308—187 **25 Claims**



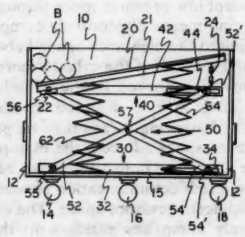
An antifriction bearing assembly and more particularly a ball or roller bearing assembly in which a pair of annular grease chambers are provided axially adjacent to an annular space formed between outer and inner rings and annular air chambers are further provided axially adjacent to the annular grease chambers, wherein the annular grease chambers are opened only to the annular space and the annular air chambers are communicated with each other by a passage bypassing the grease chambers.

3,663,078

RECEPTACLE AND IMPROVED FLOATING PLATFORM THEREFOR

William C. Moore, and Alfred J. Boos, both of Spartanburg, S.C., assignors to Insulating Fabricators, Inc., Spartanburg, S.C.

Filed Oct. 19, 1970, Ser. No. 81,920
Int. Cl. A47f *1/00*
U.S. Cl. 312—71 **17 Claims**



A doff truck having an improved floating platform is disclosed herein. The floating platform positioned within the doff truck or other type work receptacle is spring loaded to maintain the working surface of the platform at a convenient level for an operator who is utilizing the contents from the truck or receptacle. The platform is supported by a scissors type collapsible structure having spring means associated therewith. The platform, per se, is pivotally connected at one end to the supporting structure whereby, the spring means acting on the platform and the structure biases the platform around its pivotal connection to an inclined position. The inclined surface of the floating platform permits articles thereon to roll down the incline and collect at one end of the receptacle, whereby an operator may work from the one end only. Various pivotal connections and spring arrangements for providing the inclined floating platform are disclosed.

Once the platform receives a sufficient amount of weight produced by articles placed thereon, the weight of the articles overcomes the bias of the spring means and the platform assumes a horizontal attitude. After the addition of further articles onto the platform, the platform, while maintaining the horizontal attitude, moves downwardly within the receptacle as the added weight gradually overcomes the force of the spring means.

3,663,079

MODULAR ELEMENTS FOR PIECES OF FURNITURE AND PIECES OF FURNITURE OBTAINED THEREBY

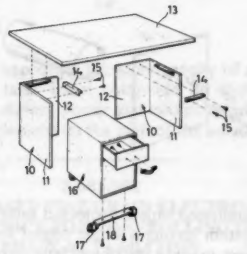
Osvaldo Borsani, Varedo (Milan), and Eugenio Gerli, Milan, both of Italy, assignors to Tecono S.p.A., Milan, Italy

Filed Oct. 20, 1969, Ser. No. 867,672

Claims priority, application Italy, Oct. 22, 1968, 22835 A/68

Int. Cl. A47b *17/00, 19/00, 27/00*

U.S. Cl. 312—195 **2 Claims**



An assembly of modular elements for making up pieces of furniture is disclosed, which essentially comprises at least two angularly shaped uprights and a planar element, all of these modular elements being assembled by means of ledges and self-tapping screws. A filing cabinet can also be provided and removably connected to the piece of furniture if desired.

3,663,080

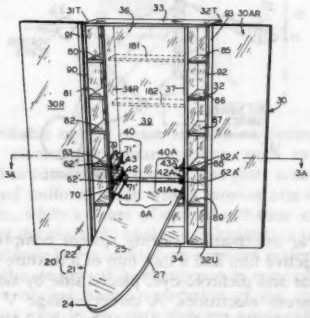
HIDE-AWAY DECOR IRONING CENTER

Oma Merle Ayers, 4905 Yale, Amarilla, Tex.

Filed Feb. 12, 1970, Ser. No. 10,867

Int. Cl. A47b *83/00, 67/02, 3/00*

U.S. Cl. 312—237 **4 Claims**



Combination of folding ironing board and cabinet therefor hung from a wall, formed from cooperating thin elements providing adjustable height of board and great mechanical stability in operation yet with low space requirements.

3,663,081

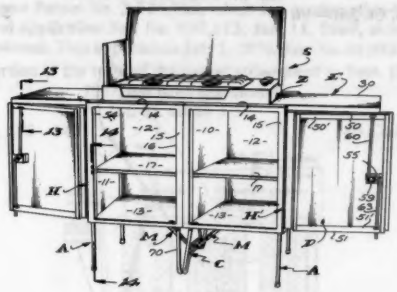
CAMP-STOVE CABINET

Stanley J. Williams, 7955 Haskell Ave., Van Nuys, Calif.

Filed Dec. 17, 1970, Ser. No. 99,089

Int. Cl. A47b *77/08;* **A47f** *3/04*

U.S. Cl. 312—236 **8 Claims**



A portable, break-down storage and camp-stove supporting cabinet comprising a pair of similar storage box-units with open fronts, means releasably securing inner opposing side walls of the units together, the tops of said units having longitudinally extending, aligned channels, extension shelves slidably engaged in the channels and shiftable longitudinally outward to project from the outer oppositely disposed ends of the related units to cooperate with the channels and with each other to define an upwardly opening camp-stove receiving well or recess; doors pivotally mounted to the forward outer corners of the units to shift from overlying engagement over the open fronts of the units to supporting engagement below the forward outer corners of their related extended shelves, manually operable latch means to selectively releasably latch the doors in their related units and to their related shelves and adjustable support means comprising foldably support legs of predetermined vertical extent depending from the inner opposing end portions of the units and vertically adjustable leveling legs depending from the outer end portions of the units.

3,663,082

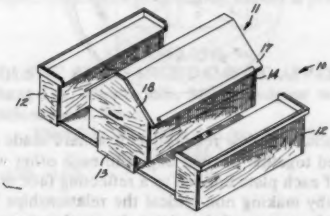
PLAY CHEST

Lynn S. Geddes, P.O. Box 133, Stanton, N.Y.

Filed July 21, 1970, Ser. No. 56,805

Int. Cl. A47b *83/00, 39/00*

U.S. Cl. 312—235 **3 Claims**



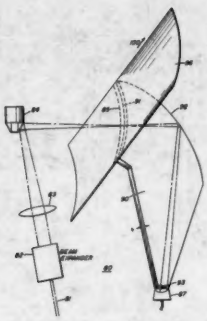
A toy chest is provided having an upper and a lower storage area. Access to the lower storage area is obtained by lifting the two covers. Each cover in its lowered position provides a desk surface and when supported in a raised position provides a table. A bench is associated with each desk and is attached to the toy chest to form a single unitary unit.

3,663,083

LIGHT DIRECTING DEVICE HAVING AN ELLIPTICAL REFLECTING FACE

Jerrold Friedman, and Robert Walker, both of Stamford, Conn., assignors to Columbia Broadcasting Systems, Inc.

Filed Sept. 15, 1970, Ser. No. 72,308
Int. Cl. G02b 5/14, 17/00
U.S. Cl. 350—96 R 5 Claims



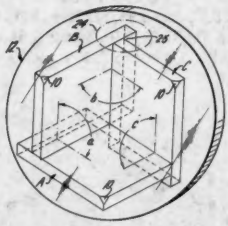
A light directing device adapted for use in a film scanning apparatus in which a beam is scanned about a rotation axis and converges to a focus at a circular arc at which a film is positioned. The device comprises a transparent body having an entrance face, a reflecting face, and an exit face. The entrance face has a circular shape and is adapted to be positioned behind the film so as to receive the light beam transmitted through the film. The reflecting face has an elliptical shape and is angularly oriented with respect to the entrance face such that it reflects the light beam substantially perpendicularly and toward the exit face. The light beam leaving the exit face is confined to a small enough area to be received by a single photodetector.

3,663,084

HOLLOW RETROREFLECTORS

Morton S. Lipkins, 3 Nemeth St., Malverne, N.Y.

Filed June 18, 1970, Ser. No. 47,245
Int. Cl. G02b 5/12
U.S. Cl. 350—102 12 Claims



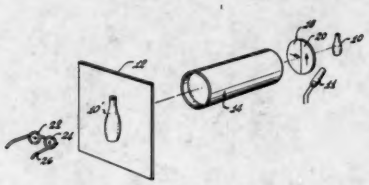
In one form, a hollow retroreflector is here made of three plates joined together at right angles to each other with only one edge of each plate bonded to a reflecting face of another plate, thereby making non-critical the relationships between the edges of any one of the plates. In another form, one of the three plates has two edges that intersect at a slight obtuse angle that is non-critical, the length of one edge abutting the reflecting face of another plate while the other edge contacts the remaining plate only at a location remote from the common corner of the retroreflector, again involving non-critical edge relationships as to each of the plates of the retroreflector. For stability of the optically flat faces, the plates are made relatively thick and accordingly have relatively wide edges that abut others of the plates. The abutment edges are joined to related reflecting faces by bonding material restricted to a zone that is narrow relative to the width of the abutment edge. The plates have individual corners remote from the common corner of the retroreflector, and a common glass plate is bonded to those individual corners so as to resist deforming stresses that may be imposed on the plates.

3,663,085

STEREOSCOPIC VIEWING APPARATUS WITH SINGLE-AXIS OPTICAL SYSTEM WITH CONVENTIONAL OBJECT LENS

Allen V. C. Davis, 5600 Alta Canyada, La Canada, Calif.

Continuation-in-part of application Ser. No. 773,897, Nov. 6, 1968, now abandoned. This application Oct. 1, 1970, Ser. No. 77,273
Int. Cl. G02b 27/26; G03b 35/22
U.S. Cl. 350—132 1 Claim



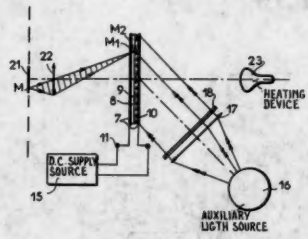
For an illuminated object projected onto a screen through an optical system having a single object lens, light reflected from the object reaches the object lens through right and left polarizers and wherein the polarizing crystals in each are oriented at right angles to those in the other. The projected image is viewed through a second pair of right and left polarizers, shown as eyepieces in frames to be worn as glasses. Due to the combined effects of the polarizers, the image seen through the eyepieces appears three dimensional.

3,663,086

OPTICAL INFORMATION STORING SYSTEM

George Assouline; Eugene Leiba, and Erich Spitz, all of Paris, France, assignors to Thomson-CSF

Filed June 23, 1970, Ser. No. 49,012
Claims priority, application France, July 2, 1969, 6922335
Int. Cl. G02f 1/18
U.S. Cl. 350—150 4 Claims



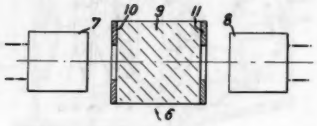
An optical information storing system comprises a thin photoconductive film and a thin film of a mixture of nematic liquid crystal and dichroic dye, placed side by side between two transparent electrodes. A direct voltage V is applied between said electrodes. The data to be stored are projected optically onto the photoconductive film with a radiation to which the photoconductor is sensitive. The mixture film is illuminated by an auxiliary radiation which is rectilinearly polarized and has a wavelength corresponding to an optical absorption line of the dichroic dye, the photoconductor being sensitive to this radiation.

3,663,087

DEVICE FOR IMPROVING THE HOMOGENEITY OF A LASER BEAM

Hubert Guillet; Louis Jacob, both of Saint Germain les Arpajon; Jacques Mouchart, L' Hay les Roses, and Bernard Sturel, Saint Michel sur Orge, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 16, 1970, Ser. No. 3,465
Claims priority, application France, Jan. 28, 1969, 6901702; Mar. 19, 1969, 6907825
Int. Cl. G02f 1/20
U.S. Cl. 350—150 12 Claims



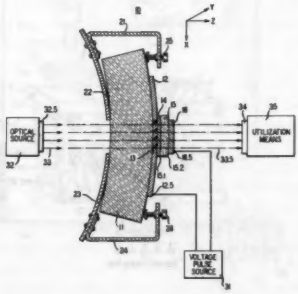
The device for improving the homogeneity of a light beam and especially a laser beam comprises an element having radially variable rotatory power and two polarizers placed on each side of said element on the path of the beam.

3,663,088

STRAIN-BIASED FINE GRAIN ELECTROOPTIC CERAMIC DEVICE FOR CONTROLLING OPTICAL PHASE RETARDATION

Juan Ramon Maldonado, Berkeley Heights, and Allen Henry Meitzler, Morristown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 10, 1970, Ser. No. 62,358
Int. Cl. G02f 1/20
U.S. Cl. 350—150 10 Claims



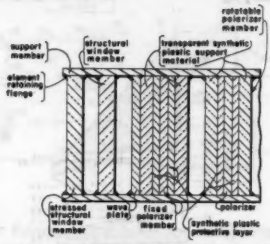
A controllable optical phase retardation device includes a fine grain electrooptic ceramic plate, such as lanthanum doped lead zirconate-lead titanate. The plate is subjected to a constant and uniform strain with a tension axis in the plane of the plate, while a beam of optical radiation traverses the thickness of the plate. By applying voltages to a pair of transparent electrode layers located on opposed major surfaces of the plate, the degree of birefringence is controlled, that is, the relative optical phase retardation of the extraordinary and ordinary rays in the optical beam propagating through the plate is controllably varied by the electric fields perpendicular to the surfaces of the plate. This control over the phase retardation can be converted into optical intensity modulation or optical beam deflection by means of a conventional polarizer together with an optical analyzer or a doubly refracting prism.

3,663,089

HIGH ORDER WAVE PLATE CORRECTION OF POLARISCOPIC EFFECTS IN WINDOWS HAVING INFRARED FILTERING

Albert S. Makas, Medford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 771,970, Oct. 30, 1968, now Patent No. 3,528,722, which is a continuation-in-part of application Ser. No. 697,113, Jan. 11, 1968, now abandoned. This application July 1, 1970, Ser. No. 51,593.
The portion of the term of the patent subsequent to Sept. 15, 1987, has been disclaimed.
Int. Cl. G02b 5/30
U.S. Cl. 350—147 40 Claims



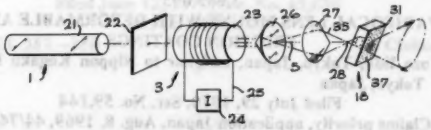
A light-transmitting window apparatus including a system which impedes the transmission of infrared radiation and comprises a light-polarizing element and a high order wave plate.

3,663,090

LIGHT DEFLECTION BY EXTERNAL CONICAL REFRACTION

Wendell S. Miller, 1341 Comstock Avenue, Los Angeles, Calif.

Filed July 10, 1970, Ser. No. 53,902
Int. Cl. G02f 1/26
U.S. Cl. 350—150 3 Claims



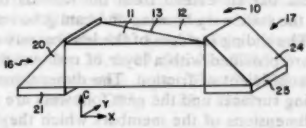
A system for producing continuously variable displacement either spacially or angularly of a beam of linearly polarized light of appropriate collimation as specified comprising a source of linearly polarized light, a polarization rotater and an appropriately oriented optically biaxial crystal. A novel electro-optic continuous polarization rotater is provided.

3,663,091

ACOUSTIC RESONANCE DAMPING APPARATUS

Tzou-Chang Lee, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 17, 1969, Ser. No. 885,795
Int. Cl. G02f 1/20
U.S. Cl. 350—160 4 Claims



Apparatus is disclosed which utilizes an acoustic impedance matching technique to substantially reduce the oc-

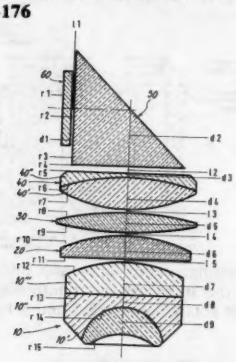
currence of acoustic resonances in an electro-optic crystal. In one embodiment, the acoustic resonance damping apparatus is adapted to apply an electric field to the electro-optic crystal. Several additional embodiments are disclosed.

3,663,092

ELBOW MAGNIFYING LENS

Franz Schlegel, Munich, Germany, assignor to Optische Werke G. Rodenstock, Munich, Germany

Filed July 27, 1970, Ser. No. 58,632
Claims priority, application Germany, July 25, 1969, P 19 37 797.0
Int. Cl. G02b 1/00, 17/00
U.S. Cl. 350—176 5 Claims



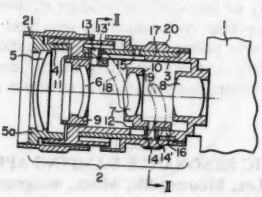
A four element magnifier with right angle prism which includes, in the direction from the eye to the object, a three-component lens with two cemented surfaces, two single collecting lens and a further two-component collecting lens with one cemented surface which is adjoined by a right angle prism.

3,663,093

VARIFOCAL LENS MOUNT WITH DEFORMABLE ANTI-FRICTION COATINGS

Yozo Iida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed July 29, 1970, Ser. No. 59,144
Claims priority, application Japan, Aug. 8, 1969, 44/74826
Int. Cl. G02b 7/10
U.S. Cl. 350—187 6 Claims



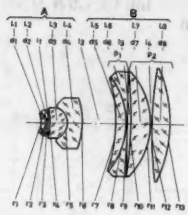
A varifocal lens including a cam cylinder rotatably mounted on a stationary housing, and lenses held in lens barrels slideably positioned within the stationary housing to vary the focal length of the varifocal lens. Cam followers to position the lens barrels extend from the lens barrels to guide grooves in the stationary housing and cam grooves in the cam cylinders. The sliding surfaces of the lens barrels and the cam followers are provided with a layer of resilient material having a low coefficient of friction. The dimensions of the lens barrel sliding surfaces and the cam followers are made larger than the dimensions of the members which they contact, so that the resilient material will be slightly deformed and thereby take up the play between the lens barrels and cam followers and their respective coacting members.

3,663,094

GALILEAN-TYPE TELESCOPE SYSTEM

Ludwig Bertele, Heerbrugg, Switzerland, assignor to Firma Wild Heerbrugg AG, Heerbrugg, Switzerland

Filed Aug. 10, 1970, Ser. No. 62,510
Int. Cl. G02b 9/60, 9/62, 23/00
U.S. Cl. 350—212 7 Claims



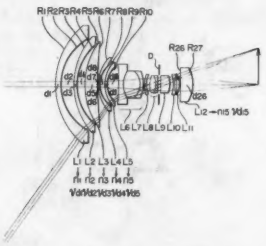
A Galilean-type telescope system comprising a negative system component and a positive system component. The negative system component embodies at least two air-spaced lens members and the positive system component embodies at least two air-spaced lens members, with the lens member disposed closer to the eye having negative refractive power and the following members having positive refractive power.

3,663,095

RETROFOCUS TYPE SUPER-WIDE ANGLE OBJECTIVE LENS

Ikuo Mori, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 26, 1970, Ser. No. 67,042
Claims priority, application Japan, June 5, 1970, 45/47925
Int. Cl. G02b
U.S. Cl. 350—214 7 Claims



A retrofocus type super-wide angle objective lens system usable with a single-lens reflex camera includes a divergent group forming the forward part of the lens system, a quasi-symmetric group disposed behind the divergent group having a diaphragm disposed intermediately thereof, and a convergent group forming the rearward part of the lens system. The satisfactory correction is made both of the negative distortional aberration inherent to the retrofocus type lens and the curvature of meridional plane resulting from the correction of said negative distortional aberration, thereby providing an angle of field ranging from 100° to 110° and a relative aperture of F/5.6 or higher brightness.

3,663,096

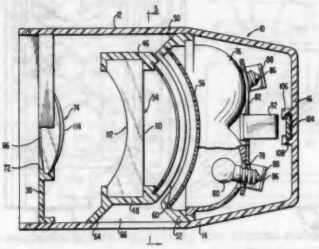
WIDE ANGLE VIEWER

David L. Fuller, Atlanta, Ga., assignor to Scripto, Inc., Atlanta, Ga.

Continuation of application Ser. No. 794,890, Jan. 29, 1969, now abandoned. This application Sept. 22, 1970, Ser. No. 74,531

Int. Cl. G02b *27/02, 3/06, 5/10*

U.S. Cl. 350—238 7 Claims



A non-distorted image of a panoramic negative is presented to the eye in a viewer having an arcuate film gate and a magnifying system formed of at least one non-spherical lens.

3,663,097

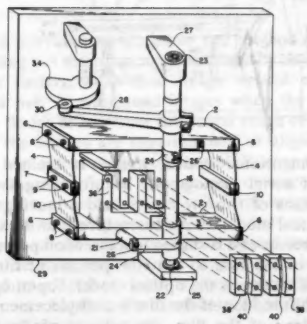
RESILIENT MOUNTING STRUCTURE FOR MOVING AT LEAST TWO OPTICAL ELEMENTS IN PRECISE OPTICAL ALIGNMENT

Roy W. Aday, Jr., La Habra, and Maoyeh Lu, Fullerton, both of Calif., assignors to Beckman Instruments, Inc.

Filed Feb. 27, 1970, Ser. No. 15,154

Int. Cl. G02f *1/30*

U.S. Cl. 350—271 1 Claim



There is disclosed a flexible mounting structure, rigidly supported at only two locations, for providing opposed precision motion of at least two mounting surfaces oppositely disposed upon the mounting structure in response to a force coupled symmetrically applied to the mounting structure. A pair of resilient connecting members, each having one of the two locations for support, and a pair of rigid mounting rails, each rail having at least one of the mounting surfaces disposed thereon, are connected to form a parallelogram whereby the mounting surfaces are substantially parallel. A rotatable shaft is disposed at right angles and adjacent to the rigid mounting rails. A drive tape is connected between the rotatable shaft and each of the rigid mounting rails in such a manner that as the shaft is rotated, each drive tape wraps around the shaft to provide the symmetrical force couple which moves the mounting rails. A cam follower arm is attached to the rotatable shaft and a cam roller bearing attached to the arm rides on a rotatable cam. Optical elements attached to the mounting surfaces transverse a precision path in accordance with the motion of the mounting rails.

3,663,098

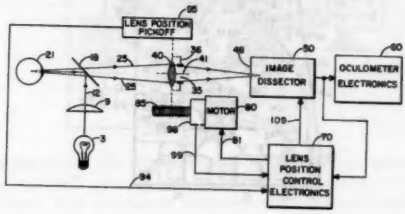
AUTOMATIC FOCUSING FOR OCULOMETERS

John Merchant, Needham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 11, 1971, Ser. No. 105,525

Int. Cl. A61b *3/10*; G01j *1/00*; H01j *3/14*

U.S. Cl. 351—6 10 Claims



An automatic focusing apparatus for oculometers wherein a reflected corneal image is projected by a lens through an aperture of non-circular outline onto a detector. The detector circularly scans the periphery of the projected image and produces an output indicative of the magnitude and sense of an out of focus condition. The detector output is combined with a lens position signal and a lens position rate signal and controls a servo to position the lens so that a focused condition is achieved and maintained.

3,663,099

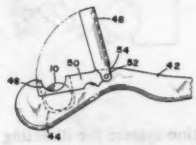
EYEGLASS FRAME WITH CAVITIES FOR STORING CONTACT LENSES

Jacob A. Saffir, Los Angeles, Calif., assignor to Dentsply International Inc., York, Pa.

Filed June 12, 1970, Ser. No. 45,650

Int. Cl. G02c *1/00*

U.S. Cl. 351—158 7 Claims



This invention pertains to several embodiments of an eyeglass frame having means to support conventional ophthalmic lenses and, in addition, having compartment means adapted to retain contact lenses for the wearer, which are to be substituted periodically for the conventional ophthalmic lenses.

3,663,100

ELECTROPHOTOGRAPHIC APPARATUS

Yoshio Itoh, and Hiroshi Tanaka, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1969, Ser. No. 828,959

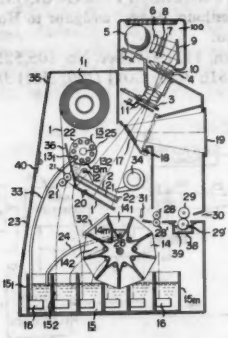
Claims priority, application Japan, June 7, 1968, 43/39225

Int. Cl. G03g *15/22, 15/10*

U.S. Cl. 355—4 11 Claims

Electrophotographic printing apparatus wherein a photosensitive member is maintained in stationary tilted position throughout multi-color image-forming and development.

Ejector and receptor elements are selectively rotated into operative position relative to the photo-sensitive member



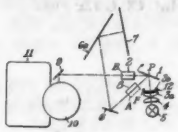
respectively for cascading treating solutions thereover and for collecting dispensed treating solutions.

3,663,101

MICROFILM VIEWER-PRINTER

Walther Vor Grabe, Koeningstein, Germany, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Apr. 30, 1969, Ser. No. 820,583
Claims priority, application Japan, Apr. 30, 1968, 43/29032
Int. Cl. G03b *13/28*
U.S. Cl. 355—45 **2 Claims**



A film projection system for directing an image through a rotatable reflecting mirror and an objective lens in selective paths. One path includes fixed reflecting mirrors and a screen to provide a complete projection. The other path which is determined by the rotation of the reflecting mirror provides a slit projection on a rotatable drum.

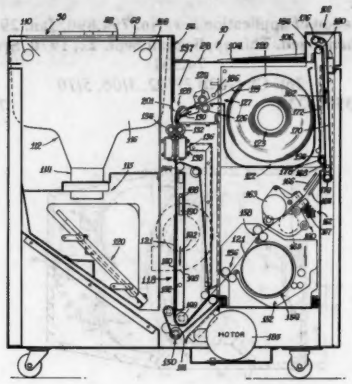
3,663,102

HIGH SPEED PHOTOELECTROSTATIC COPYING MACHINE

Arthur S. Zerfahs, Elk Grove, Ill., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Filed Dec. 31, 1969, Ser. No. 889,594
Int. Cl. G03g *15/00*
U.S. Cl. 355—14 **5 Claims**

A counter controls the processing of multiple copies of an original in a high-speed, roll fed copying machine. Timer circuitry operated in the multiple copy mode provides signals to initiate the feeding of copy material from the roll for successive copies. A movable length sensor in the path of the copy material discontinues the feeding of copy material and actuates a cutter to sever a preselected length of copy material. The time period between signals is variable in accordance with the selected copy length so as to provide a correspond-



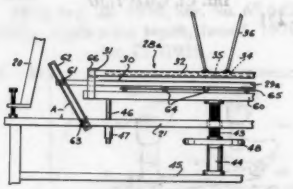
ing spacing between successive lengths of severed copy material.

3,663,103

PRODUCTION OF A MODIFIED ORTHOPHOTOGRAPH

Stanley Hoover Collins, Guelph, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Continuation-in-part of application Ser. No. 665,521, Sept. 5, 1967. This application Sept. 15, 1970, Ser. No. 72,487
Int. Cl. G03b *27/44, 27/68*
U.S. Cl. 355—22 **19 Claims**



A three-dimensional optical model is created from a stereo-pair of aerial photographs by projecting the photographs by means of two projectors, and a moving aperture scans the optical model. A photosensitive film is exposed to one of these beams and is shifted in a direction perpendicular to the plane of the film so that the portion of film that is being exposed intersects the optical model. Superimposed on the vertical shift motion of the film is a displacement tangential to the plane of the film, the amount of displacement being in a preselected relationship to the extent of the vertical shift, such preselected relationship preferably being a logarithmic one.

3,663,104

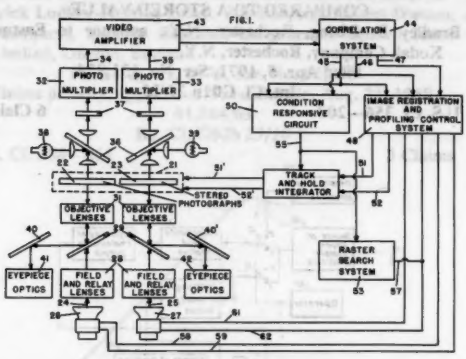
AUTOMATIC STEREOPLOTTING APPARATUS

John Montgomery Godfrey, Camberley, England, assignor to Itek Corporation, Lexington, Mass.

Filed May 19, 1970, Ser. No. 38,809
Int. Cl. G01c *11/12*
U.S. Cl. 356—2 **16 Claims**

Disclosed in an automatic stereoplotter in which terrain elevation indicating x-parallax corrections are held in response to the absence of a given minimum level of correlatable image detail. This prevents inaccurate, noise responsive x-parallax corrections when traversing image areas such as water bodies having low correlatable informa-

tion content. To insure a timely restoration of normal operations, a search system responds to a hold of *x*-parallax correction by systematically searching the stereo model in the *x*-direction for image areas retaining a sufficient level of correlatable image detail.



3,663,105
METHOD AND APPARATUS FOR MEASURING RANGE UTILIZING SUPERIMPOSITION OR ALIGNMENT OF IMAGES

Alton D. Anderson, 2360 Ridge Drive, Northbrook, Ill.

Filed June 28, 1967, Ser. No. 649,520
Int. Cl. G01c *3/08*
U.S. Cl. 356—4 **12 Claims**

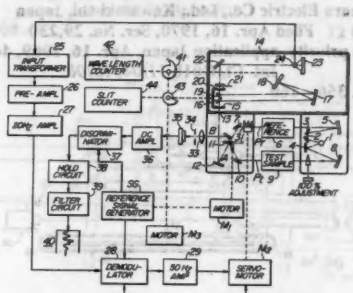
There is provided an apparatus and method for automatically reading out the range as determined by dual image optical range finders. Such dual image optical range finders produce a pair of misaligned images when the set range of the range finder differs from the actual range of a distant object, and the images are superimposed or aligned when the set range and actual range correspond. Passing the projected image of the range finder through one or more moving slits to shutter the projected image will form image pulses, the separation of which represents the error between the set and actual range of the range finder. A light detector, such as photoelectric cells, converts the image pulses into electrical pulses and an electrical circuit system is provided to detect the differences between the conditions of exact image alignment and the alignment error.

3,663,106
OPTICAL NULL METHOD SPECTROPHOTOMETERS

Shigeo Minami, Ashiya, and Kenji Fukuda, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 26, 1970, Ser. No. 40,513
Claims priority, application Japan, May 28, 1969, 44/40964
Int. Cl. G01j *3/42*; G01n *21/34*
U.S. Cl. 356—89 **14 Claims**

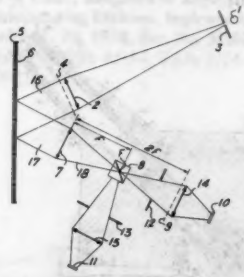
An optical null method spectrophotometer with which the difference between the intensity of a test sample beam representing the quantity of light transmitted through a test sample and the intensity of a reference sample beam representing the quantity of light transmitted through a reference sample is detected and amplified to drive a servo mechanism to thereby displace an optical attenuator inserted in the path of the reference beam, so as to vary the reference sample beam until the test sample beam and the reference sample beam are balanced with each other to thereby obtain transmission spectra or absorption spectra of the test sample, characterized in that separate means is provided for producing an electrical signal proportional to the variation in the reference sample beam resulting from the displacement of the optical attenuator and that the electrical signal produced by the separate means is recorded by a recorder.



3,663,107
NONDESTRUCTIVE METHOD FOR MEASURING STATES OF SURFACE AND APPARATUS FOR CARRYING OUT SAID METHOD

Pierre M. Denis, 4 place Paul Mistral, 38 Grenoble, and Roger H. Guicherd, Rue du Mail, 38 Saint-Egreve, both of France

Filed Jan. 5, 1971, Ser. No. 103,994
Claims priority, application France, Jan. 6, 1970, 7000205
Int. Cl. G01b *11/30*
U.S. Cl. 356—120 **2 Claims**



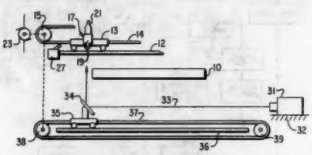
A beam of parallel rays which emerges from a perpendicular object-grid is reflected from a mirror surface and transmitted through a centered optical system to a Lummer dividing cube located at the image focal point of said system so as to produce a direct beam which is focused onto a photoelectric cell after passing through an image-grid and a beam which is deflected at right-angles and focused onto a second photoelectric cell. The image-grid is displaced transversely so as to stop light from the object-grid and the mirror surface is replaced by the surface to be studied. The quotient of the indications given by the two balanced photoelectric cells is characteristic of a given state of surface. The indication given by the deflected-beam cell provides the albedo of a given surface state and color.

3,663,108

APPARATUS FOR MEASURING THE DIMENSIONS OF OBJECTS WHICH INCLUDES A CARRIER WHICH TRAVELS ACROSS THE OBJECTS TO BE MEASURED

Hiroshi Yamamuro, Yokohama; Akira Kawase, Tokyo, and Akio Sakai, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Apr. 16, 1970, Ser. No. 29,230
Claims priority, application Japan, Apr. 16, 1969, 44/28959
Int. Cl. G01b *11/04, 13/08*
U.S. Cl. 356—160 4 Claims



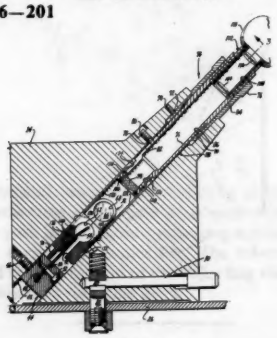
An apparatus for measuring the width of a web material includes a carrier which travels across the web. The carrier has mounted thereon a photoelectric transducer and a magnetic induction type pulse generator for enabling exact detection of the opposite edge portions of the web. An elongated magnetically recorded fixed scale extends through the entire travel span of the carrier and is magnetically coupled to the pulse generator. The scale includes finely distributed magnetically recorded marks on the magnetic base thereof, along the lengthwise direction of said scale. A counter counts the pulses which emanate from the pulse generator in the absence of a detected electric signal from the photoelectric transducer, the absence indicating the presence of the web such that the opposite edge portions of the web are readily detected and measurement of the web width made.

3,663,109

VIEWING APPARATUS FOR USE IN A PHOTOMETER

Thomas D. Sharples, Atherton, Calif., assignor to Beckman Instruments, Inc.

Filed Apr. 13, 1967, Ser. No. 630,563
Int. Cl. G01n *21/24*
U.S. Cl. 356—201 7 Claims



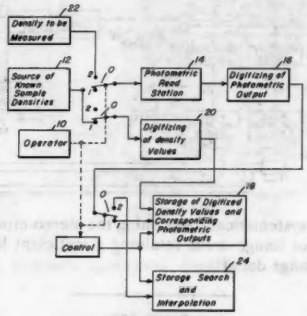
A low power microscope is optically coupled by a partial reflector to the output light beam passed through a region of a photometer containing a sample of material being investigated. The microscope provides an observable image encompassing the region and is adjustable to bring various portions of the region into sharp focus. The reflector is carried on a base coupled to the end of the microscope so that extreme positions of the latter cause the base to move between a lowered position in which the reflector intercepts a portion of the output light beam and a raised position out of the path of the light beam. In the raised position a portion of the base serves to block the optical path through the viewer to thereby exclude stray light.

3,663,110

APPARATUS RESPONSIVE TO OPTICAL DENSITY WHEREIN AN UNKNOWN SAMPLE DENSITY IS COMPARED TO A STORED VALUE

Bradley D. Rising, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 5, 1971, Ser. No. 131,324
Int. Cl. G01n *21/22*
U.S. Cl. 356—203 6 Claims



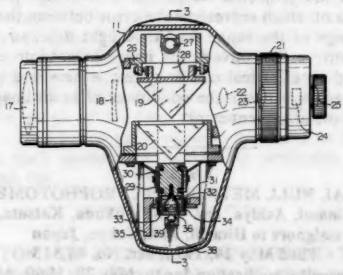
A set of digitized values of a density-dependent variable are stored in computer memory. A corresponding set of digitized photoelectric signals, produced from a set of reference densities, are also stored in computer memory. An unknown sample density is photoelectrically examined, the resultant signal being digitized and searched for within the computer memory, thereby to gate out of memory the digitized value of the density-dependent variable that corresponds to the digitized photoelectric signal of the sample.

3,663,111

SELF LEVELING TRANSIT LEVEL HAVING NOVEL LOCKING MECHANISM

Shozo Tsuda, and Masanori Nozaki, both of Tokyo, Japan, assignors to Fuji Koki Kabushiki Kaisha, Kawasaki-shi, Japan

Filed July 17, 1970, Ser. No. 55,683
Claims priority, application Japan, July 31, 1969, 44/59997
Int. Cl. G01c *9/12*
U.S. Cl. 356—250 4 Claims



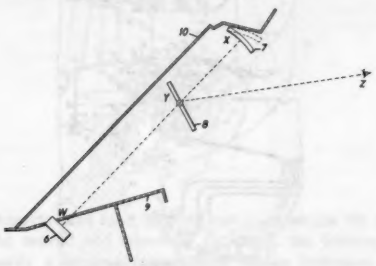
A self leveling transit level including a telescope means incorporating therein automatic level line compensator means and means for locking the swinging portion of the compensator means, whereby the telescope may be adapted for use as a transit when the lock means is operative to lock the swinging portion and for use as a level when the lock means is not in operation.

3,663,112

HEAD-UP DISPLAY SYSTEM INCLUDING A CONCAVE REFLECTOR AND A MOVABLE COMBINING MIRROR

Patrick Ludlow Fleming Jones, Windsor, and Robert Watson, Sandhurst, both of England, assignors to Sperry Rand Limited, London, England

Filed Aug. 10, 1970, Ser. No. 62,396
Claims priority, application Great Britain, Aug. 21, 1969, 41,664/69
Int. Cl. G02b *23/10*
U.S. Cl. 356—251 3 Claims



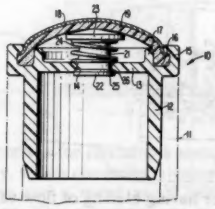
An optical "head-up" display system for use in aircraft comprises an information display formed by an illuminated fiber optic bundle in a graticule box mounted below the windscreen of the aircraft. An optical projection system comprising a spherical mirror mounted above the windscreen and a semi-reflecting mirror reflect the display to be seen by the pilot superimposed on his view through the windscreen. The display is stabilized in roll by rotating the graticule, and is stabilized in pitch either by moving the semi-reflecting mirror or by moving the relevant part of the graticule.

3,663,113

FLUID APPLICATOR ASSEMBLY

John J. Frain, 517 B. 137 St., Belle Harbor, N.Y., and Frank T. Brunner, 418 B. 131 St., Rockaway Park, N.Y.

Filed Aug. 14, 1970, Ser. No. 63,779
Int. Cl. B43k *5/00*
U.S. Cl. 401—206 2 Claims



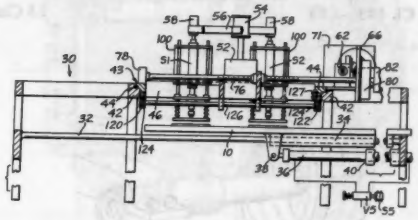
A fluid applicator assembly including a retainer ring adapted to be snugly fitted within the open end of a container, the ring having at one end an inwardly extending peripheral web member having a valve opening therein, a cover means secured to the forward end of the retainer, a valve stem extending through the valve opening and having an abutment at one end lying against a cover means for the assembly and a valve head at its other end lying against the underside of the web, and a coil spring urging the valve stem in a forward direction, the wall of the web opening being inclined forwardly so as to define a valve seat and the wall of the web opening being further inclined inwardly so as to permit easy snap-in insertion of the valve stem through the opening.

3,663,114

TAPE CONTROLLED AUTOMATIC MACHINE, ESPECIALLY FOR PRINTED CIRCUIT BOARDS

Alan B. Welsh, and Roger T. West, both of Jasper, Ind., assignors to Jasper Electronic Mfg. Corp, Jasper, Ind.

Filed Mar. 24, 1970, Ser. No. 22,253
Int. Cl. B23b *39/08*
U.S. Cl. 408—3 12 Claims



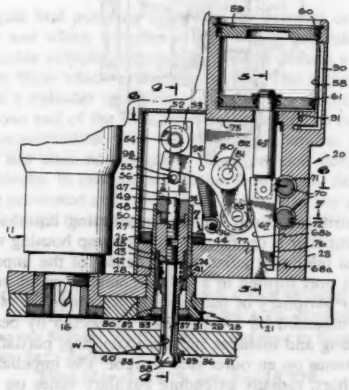
A drilling machine, especially for drilling printed circuit boards wherein the circuit boards to be drilled are mounted on a table over which is positioned a drilling spindle for each circuit board. The drilling spindles are mounted on a carriage which moves in steps at right angles to each other so as to be able to align the spindles with any hole to be drilled in the entire area of the board. A tape controlled circuit is provided which controls the movement of the carriage and the advancing and retracting of the spindles during a drilling operation. Advantageously, the table supporting the boards to be drilled can be shuttled between two opposite end positions so that while one set of boards is being drilled, another set can be mounted on the table preparatory to drilling.

3,663,115

PORTABLE DRILL WITH POWER DRAWBAR CLAMPING DEVICE

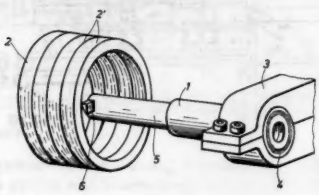
Pierre G. Vindez, Redondo Beach, and Luis A. Bohorquez, Inglewood, both of Calif., assignors to Zephyr Manufacturing Co., Inc., Manufacturing Division, Inglewood, Calif.

Filed Apr. 20, 1970, Ser. No. 30,027
Int. Cl. B23b *45/14;* B23q *3/14*
U.S. Cl. 408—79 8 Claims



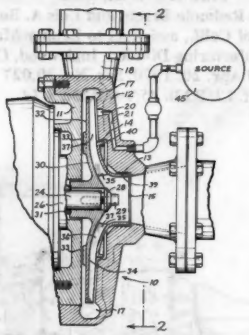
A pneumatically operated work sheet clamp attached to a portable power drill and utilizing a cam moved by a piston to operate the pilot of a collet assembly through an intermediate bell crank lever and drawbar means.

3,663,116
CANTILEVERED MACHINE PART
Theo Muller, Pattscheid, and Otto Feller, Burscheid, both of Germany, assignors to Goetzewerke Friedrich Goetze AG, Burscheid, Germany
Filed Apr. 22, 1970, Ser. No. 30,860
Claims priority, application Germany, Apr. 23, 1969, P 19 20 598.2
Int. Cl. B23b 29/03
U.S. Cl. 408—143 13 Claims



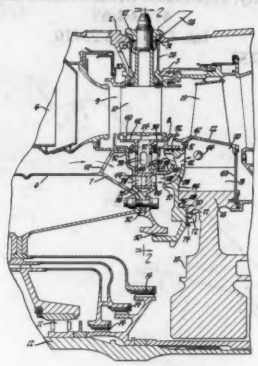
A boring bar inherently damping torsional vibrations and having an elongated outer jacket and a core arranged within the jacket, there being an energy-consuming material arranged between the inner surface of the jacket and the outer surface of the core for damping torsional displacement between the jacket and the core.

3,663,117
AERATION PUMP
Clinton C. Warren, Vancouver, Wash., assignor to Cornell Manufacturing Company, Portland, Oreg.
Filed Jan. 21, 1970, Ser. No. 4,686
Int. Cl. F04d 31/00; F04b 13/02
U.S. Cl. 415—116 4 Claims



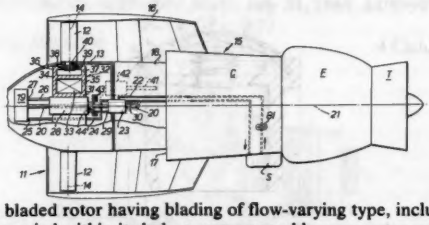
A centrifugal pump for use in aerating liquids. A disc-shaped impeller is confined within a pump housing which includes an inlet port adjacent the center of the impeller and an outlet port formed in a volute chamber which surrounds the outer periphery of the impeller. The impeller is conventionally mounted on a drive shaft supported by bearings in the housing and includes radially extending, partially closed curved vanes on an outer side thereof. The impeller also includes short, radially extending auxiliary vanes on an inner side. The periphery of the impeller is notched between the vanes to substantially the depth of the closed portions of the vanes. At least one air inlet is provided in the pump housing near the outer ends of the impeller vanes to permit the injection of air under pressure for aerating the liquid being pumped.

3,663,118
TURBINE COOLING CONTROL
Douglas Johnson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed June 1, 1970, Ser. No. 42,351
Int. Cl. F01d 25/12; F04d 27/00
U.S. Cl. 415—116 7 Claims



The turbine of a gas turbine engine has a nozzle with variable stagger angle vanes including stems which rotate with the vanes. Cooling air is supplied to the turbine from the compressor of the engine through a ring of rotary plug valves of which the movable valve members are on the vane stems. The cooling air is impelled by a fan on the turbine rotor forward face and the discharge from the fan is divided between the nozzle vanes and the turbine blades.

3,663,119
BLADED ROTORS
Ivor Harold Brooking, Wotton, and John Alfred Chilman, Painswick, both of England, assignors to Dowty Rotol Limited, Gloucester, England
Filed Apr. 7, 1970, Ser. No. 26,215
Claims priority, application Great Britain, May 3, 1969, 22,681/69
Int. Cl. B64c 11/38
U.S. Cl. 416—157 10 Claims

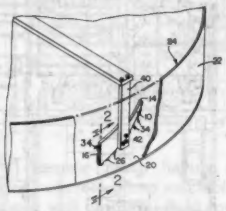


A bladed rotor having blading of flow-varying type, including, carried within its hub, a pump operable upon rotor rotation and valve means for controlling the flow of pressure fluid from the pump to a fluid-pressure-operable actuator for adjusting the blading. Conduit means, provided for conducting fluid to the pump inlet, are connectable to a source external of the rotor.

3,663,120
PLOW TOOL
Anthony C. Fortunski, Grosse Pointe Park, Mich., assignor to Fargo Machine & Tool Company, Detroit, Mich.
Filed July 2, 1970, Ser. No. 51,936
Int. Cl. B01f 7/24
U.S. Cl. 416—224 17 Claims

The invention provides for plows or plow-type tools which are attached to supporting members and positioned for rota-

tion in operative spaced relationship to interior surfaces of a mixing chamber. The plows are provided with attached edges or spacer portions of a destructible material whereby when the plow is operative the edge is destroyed and intermixes with the material in the chamber that is stirred and moved by the plow. The plow is positioned for operative movement and secured to its supporting member(s) by first setting the plow with its destructible edging or spacer portions directly upon the surfaces to which the plow movement is related. Although it is desirable to have the spacer material or edging



of a character and kind that will not contaminate the material to be moved and mixed by the plow, this feature is not necessarily a limiting requirement of the invention. Upon destruction and removal of the edging or spacer portions, the operative structure of the plow is left in properly spaced relationship to the interior surfaces of the chamber in which the plow functions. Alternatively, the spacer material may be of paper or paperboard adhesively secured to the edges of the plow and removed therefrom by peeling the paperboard away after the plow has been secured in spaced relationship in the mixing chamber.

3,663,121

GENERATION OF METAL VAPORS

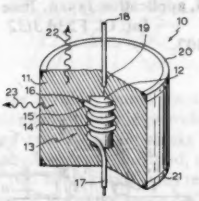
Paolo Della Porta; Mario Zucchinelli; Elio Rabusin, and Carlo Emili, all of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed May 20, 1970, Ser. No. 39,120

Claims priority, application Italy, May 24, 1969, 17304 A/69

Int. Cl. F04b *37/02*; F04f *11/00*

U.S. Cl. 417—48 **4 Claims**



A particle free device for releasing a metal vapor, such as cesium or mercury, which comprises a vapor permeable particle free envelope and a metal vapor releasing substance within the envelope. This substance can be a mixture of a metal compound and reducing agent for the compound, or can be a material such as a metal oxide which releases its metal upon heating. The devices can have a resistance heating unit in thermal proximity to the metal vapor releasing substance. These devices are useful for the introduction of metal vapors into vessels such as electron tubes.

3,663,122

AXIAL PLUNGER PUMP

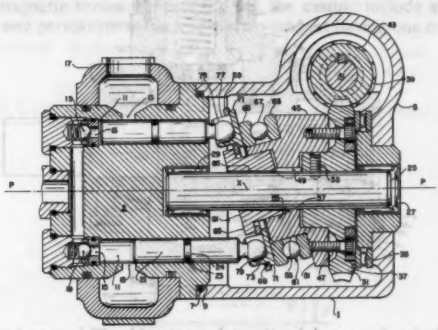
Clarence E. Kitchen, St. Louis, Mo., assignor to McNeil Corporation, Akron, Ohio

Filed Nov. 25, 1970, Ser. No. 92,590

Int. Cl. F04b *1/14, 1/02*

U.S. Cl. 417—269 **6 Claims**

An axial plunger pump of the class having a plurality of axial plungers reciprocated by a rotating wobble cam acting through a non-rotary cam follower means, and having an improved and simplified mode of assembly of the cam follower with respect to the wobble cam.



3,663,123

LIQUID FUEL INJECTION PUMPING APPARATUS

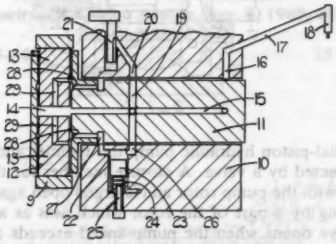
Ivor Fenne, Greenford, England, assignor to C. A. V. Limited, Birmingham, England

Filed Aug. 11, 1970, Ser. No. 62,972

Claims priority, application Great Britain, Aug. 11, 1969, 40,010/69

Int. Cl. F04b *49/00*

U.S. Cl. 417—284 **5 Claims**



A liquid fuel pumping apparatus for internal combustion engines and which includes a bore which accommodates a reciprocable pumping plunger and which defines a pumping chamber from which extends an outlet. The apparatus also includes a cylinder in which is located a resiliently loaded piston, one end of the cylinder being arranged to be brought into communication with the pumping chamber after the plunger has attained a predetermined position during its injection stroke. In this manner further flow of fuel through the outlet is prevented and relief of the pressure in any apparatus associated with the outlet is obtained.

3,663,124

DUAL CROSSOVER RELIEF AND CASE SURGE VALVE FOR HYDRAULIC MOTORS AND PUMPS

John Clayson Schultz, Buffalo, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

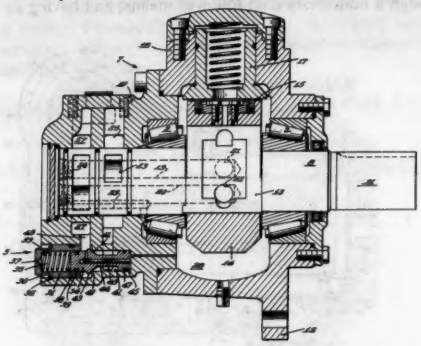
Filed Mar. 2, 1970, Ser. No. 15,778

Int. Cl. F04b *49/00*; F16k *17/26*

U.S. Cl. 417—291 **9 Claims**

A valve assembly is provided which will automatically respond to relieve overload hydraulic pressures in a hydraulic operating device such as a motor or pump, being mounted directly in the housing of the device and operatively commu-

nicating with the hydraulic operating circuit to bypass hydraulic pressure automatically when an overload in the



device is sensed by the valve assembly. This may include reversible line pressure and also case pressure.

3,663,125

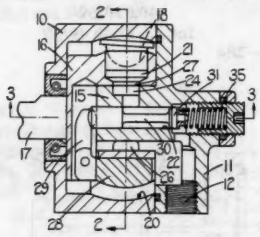
HYDRAULIC PUMP

Frank George Freeman, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 23, 1970, Ser. No. 92,041

Int. Cl. F04b *49/02*

U.S. Cl. 417—294 **6 Claims**



A radial-piston hydraulic pump has its inlet and outlet interconnected by a valve. A closure member for the valve is rotated with the pump rotor and is urged open against a biasing spring by a part of the rotor which acts as a governor. The valve opens when the pump speed exceeds a predetermined value.

3,663,126

FLUID CONTROL SYSTEMS

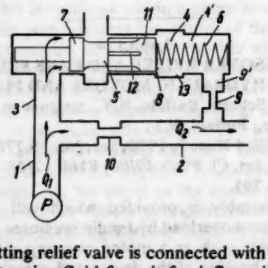
Otto Paul Ferdinand Langosch, Camberg, Germany, assignor to Firma Vickers GmbH, Frolingstrasse, Bad Homburg v.d.H., Germany

Filed Dec. 5, 1969, Ser. No. 882,704

Claims priority, application Germany, Dec. 9, 1968, P 18 13 500.7

Int. Cl. F04b *49/00*

U.S. Cl. 417—300 **4 Claims**



A flow splitting relief valve is connected with the main output flow for tapping fluid from it for influencing the output characteristic.

3,663,127

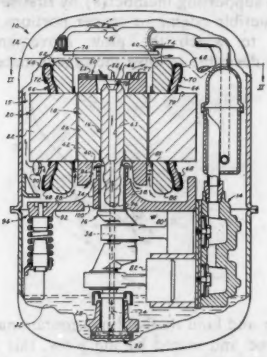
HERMETIC COMPRESSOR OIL COOLING SYSTEM

Robert J. Cheers, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Nov. 30, 1970, Ser. No. 93,550

Int. Cl. F04b *17/00, 35/00, 39/02*; H02k *9/00, 9/20*

U.S. Cl. 417—372 **7 Claims**



A hermetic motor-compressor unit of the vertical shaft type having an electric motor mounted above and driving the gas pump of the unit. The motor has its main stator winding wound radially inwardly of the auxiliary or start winding so that the end turns of the main winding are directly in the path of the lubricating oil which is flung from the outlet or outlets of a crankshaft oil passage fed from an oil pump in the sump of the compressor. The relatively cool oil thus directly impinges against and drains downwardly along the main winding to thereby effect more efficient cooling of the motor.

3,663,128

FLAME ADJUSTING DEVICE IN A BURNER FOR ALCOHOL, OIL OR THE LIKE

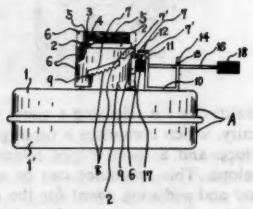
Zenjiro Yasuda, 4-98 Matsuzoh, Abeno-ku, Osaka, Japan

Filed Nov. 16, 1970, Ser. No. 89,820

Claims priority, application Japan, June 29, 1970, 45/64835

Int. Cl. F23d *3/32*

U.S. Cl. 431—307 **3 Claims**

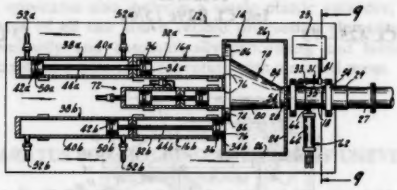


A device for adjusting the height of flame in a liquid fuel burner having an open top cylindrical wick holder around which an adjusting cylinder member is telescopically mounted for vertical and rotary movement, with a helical rib extending outwardly from said adjusting cylindrical member and having rack teeth on its under surface where the rack teeth cooperating with a pinion mounted on a shaft extending radially from the adjusting cylindrical member and mounted for rotation with a handle at the outer end, the mounting for the rotary shaft having a lug engaging the upper edge of the helical rib so that the adjusting cylindrical member will be positively moved in both vertical directions to control the flame.

3,663,129
CONCRETE PUMP

Leon A. Antosh, Rural Route, Erie, Ill.

Filed Sept. 18, 1970, Ser. No. 73,449
Int. Cl. F04b 7/00, 15/02
U.S. Cl. 417—516 18 Claims

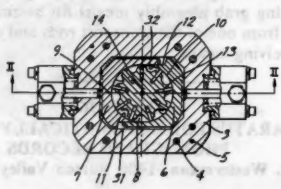


A constant flow concrete pump having a number of hydraulically actuated concrete pump assemblies connected to inlet openings in one wall of a semi-fluid concrete hopper which has a single discharge opening in the opposite wall, and a valve mounted in the hopper and having an inlet of sufficient length to encompass at least two of the inlet openings in the hopper wall, relative movement is provided between the valves and inlet openings to provide constant flow of concrete through the hopper. The valve can be fixed, oscillated or rotated.

3,663,130
VARIABLE JAWS FOR VANE PUMP

Hans Lincks, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Aug. 4, 1970, Ser. No. 60,802
Claims priority, application Germany, Aug. 4, 1969, P 19 39 595.0
Int. Cl. F03c 3/00
U.S. Cl. 418—31 2 Claims



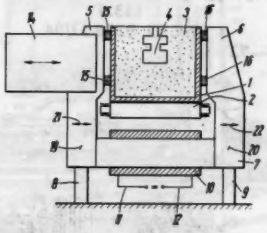
Adjustable housing for a rotary pump. In a rotary pump having radially shiftable blades there is provided an adjustable housing comprising two identical blocks which, when properly related to each other and interfitted, create a housing for the rotor. The two blocks slide with respect to each other to vary the volume of the pump space defined.

3,663,131
CASTING DEVICE

Fritz Hegewaldt, Herdecke-Kirchende, Germany, assignor to Brown, Boveri & Cie Aktiengesellschaft, Kalkstadter Strasse, Mannheim-Kafertal, Germany

Continuation of application Ser. No. 783,920, Dec. 16, 1968, now abandoned. This application Apr. 19, 1971, Ser. No. 135,406
Claims priority, application Germany, Jan. 3, 1968, P 16 08 039.0
Int. Cl. B22c 15/00
U.S. Cl. 425—3 5 Claims

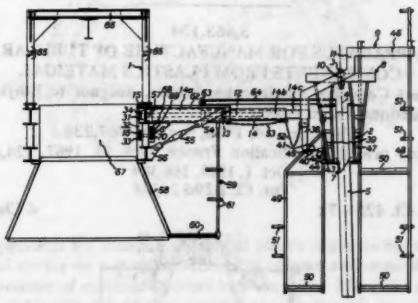
A device is provided for making castings conforming to a mold while leaving the impression of the casting preserved in the mass of particles of the casting material. There is a casting box containing loose magnetizable particles with which non-magnetizable particles may be admixed and the casting is carried out through the action of magnetic forces generated either by electromagnets or permanent magnets and the casting action is continued at least until the casting becomes strong enough to be self-supporting. The source of the magnetic forces for carrying out the casting include at least one permanent magnet or electro-magnet having one or more pole shoes which are adjustable relative to the casting box. Each magnet may be subdivided into a plurality of individual magnets. The casting box is mounted on guides of non-magnetic material which guides may be directly on the casting box or on the magnets or on their pole shoes. Simplified casting is obtained at reduced cost.



3,663,132
ARRANGEMENTS IN SLIDING FORMS

Artur Lennart Andersson, Malmo, Sweden, assignor to Aktiebolaget Armerad Betong, Malmo, Sweden

Filed Apr. 7, 1970, Ser. No. 26,369
Claims priority, application Sweden, Apr. 8, 1969, 4894/69
Int. Cl. B28b 7/04
U.S. Cl. 425—65 15 Claims



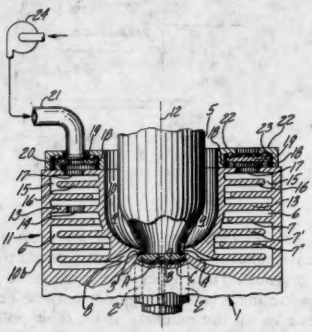
An adjustable sliding form or shuttering for concrete casting of buildings comprises relatively movable form sections to permit contraction and/or enlargement of the sliding form by the action of width regulating means to vary the width of the building, yoke-shaped scaffolding members carrying the sliding form and the scaffolding thereof for vertical movement, and climbing means operating the sliding form and the scaffolding thereof. Each of the movable form sections operable by the width regulating means is freely pivotally mounted in the scaffolding at a point above the form section to permit said form section to freely adapt itself to the width adjustment initiated by the width regulating means at the single mounting point.

3,663,133

GAS EJECTING DEVICE INCLUDING ROTARY COMPONENTS FOR COOLING EXTRUDED TUBING

Guenter Augustin, Ennepetal-Rueggeberg, and Gerd Albrecht, Remscheid-Lennep, both of Germany, assignors to Barmer Maschinenfabrik Aktiengesellschaft, Remscheid-Lennep, Germany

Filed Sept. 18, 1970, Ser. No. 73,484
Claims priority, application Germany, Oct. 22, 1969, P 19 53 113.6
Int. Cl. B29d *23/04*
U.S. Cl. 425—72 4 Claims



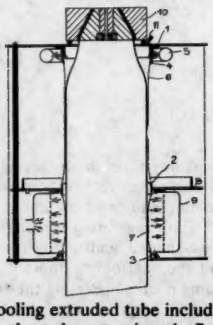
A device for applying cooling gas in an annular stream to the exterior of a tubing of plastic material as it issues from an extruding machine. The device is of generally annular configuration with stream-forming components thereof in sealed rotatable relation with other components of fixed position through which a cooling gas enters the device. The apparatus is interiorly baffled in an essentially radial direction to establish a radially and axially extending zigzag passageway for movement of the gas therethrough. The apparatus is otherwise constructed to establish uniform conditions in the cooling gas and a distribution of any thickness variation resulting from non-uniform cooling along the length of a roll of collected film.

3,663,134

APPARATUS FOR MANUFACTURE OF TUBULAR COMPONENTS FROM PLASTICS MATERIAL

Robert Coquelin, Mazingarbe, France, assignor to Ethylene-Plastique, Paris, France

Filed Oct. 14, 1968, Ser. No. 767,238
Claims priority, application France, Oct. 13, 1967, 124,440; Oct. 1, 1968, 168,309
Int. Cl. B29d *23/04*
U.S. Cl. 425—72 4 Claims



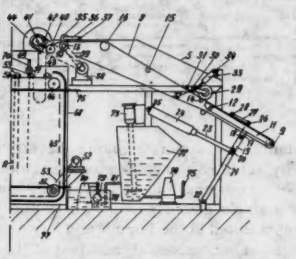
Apparatus for cooling extruded tube including a means for passing said tube through a tensioned, flexible, resilient, liquid permeable sleeve surrounding said tube having a means for applying liquid coolant to the surface of said sleeve and means for wiping said tube after passing said sleeve.

3,663,135

AUTOMATIC MACHINE FOR CUTTING, COOLING, DRYING AND PILING RUBBER SHEETS

Walter Hugo Schiesser, Hortensienstrasse 9, Zurich, Switzerland

Filed June 29, 1970, Ser. No. 50,761
Claims priority, application Switzerland, June 30, 1969, 10020/69
Int. Cl. B29c *15/00*
U.S. Cl. 425—73 13 Claims



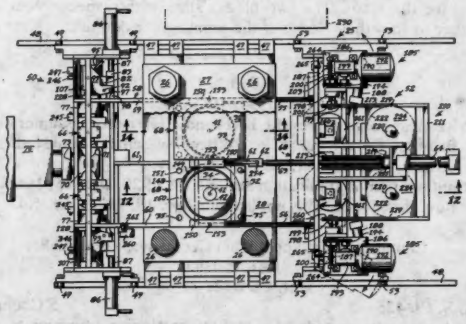
An automatic machine for cutting, cooling, drying and piling rubber sheets having a separate inlet section, a spray and cooling section and a receiving and piling section joined together so that the three casing sections together form a tunnel open at both ends; conveyor means for the rubber sheet to the inlet section control unit for programming the moving parts of the machine, a trimming device for the sheet, conveying means in the spray and cooling section for conveying transport rods on which the rubber sheets hang, past sprinklers and to a reserve storage for the rods; ventilators for circulating air in the spray and cooling section; conveyor means in the receiving and piling section with hooks extending therefrom adapted to seize a transport rod from said reserve storage and convey it to said piling section; vertically movable receiving means for receiving the sheets, and reciprocating grab assembly means for seizing the sheets as they hang from one of the transport rods and depositing them on the receiving means.

3,663,136

APPARATUS FOR AUTOMATICALLY MAKING PHONOGRAPH RECORDS

William S. Westermann, 1400 Burton Valley Rd., Nashville, Tenn.

Filed Apr. 1, 1970, Ser. No. 24,624
Int. Cl. B29d *17/00*
U.S. Cl. 425—116 7 Claims



An apparatus for loading and unloading a record press, including means for preforming the mass of plastic record material, transferring the upper and lower record labels from label magazines or supply stacks and positioning the upper label above the mass and the lower label below the mass. The

apparatus further includes means for compressing the labels and mass into a composite unit upon a load carrier, moving the carrier between the pressing dies, ejecting the composite unit upon the dies, removing the completed record from the pressing dies to an unloading station, punching the center hole in the record, trimming the flashing from the record, and removing the record to a deposit station.

This apparatus also includes a single plastic extruder, and duplicates of all the above record processing elements for simultaneously and automatically processing and finishing two records at a time in cooperation with a record press.

3,663,137

APPARATUS FOR MOLDING ARTICLES OF UNEVEN THICKNESS

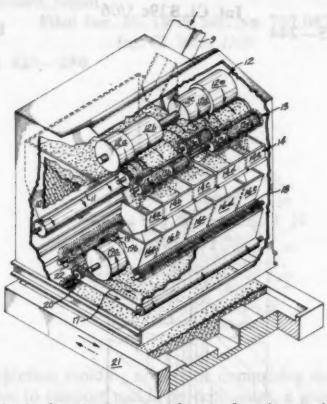
Herbert G. Haas; Edmund Munk, both of Oberstenfeld; Alfred Fink, Uhingen, and Erich Klink, Faurndau, all of Germany, assignors to Werzalit-Pressholzwerk J. F. Werz, Jr. KG, Oberstenfeld/Wurttemberg, Germany

Continuation-in-part of application Ser. No. 698,050, Jan. 15, 1968, now abandoned , which is a continuation of application Ser. No. 437,107, Mar. 4, 1965, now abandoned. This application June 30, 1969, Ser. No. 837,649

Claims priority, application Germany, Mar. 7, 1971, P 14 53 386.9

Int. Cl. B29c *5/00*

U.S. Cl. 425—148 **7 Claims**



A method of and apparatus for preforming moldable compositions of fibrous materials and a binder in which the preform had portions along its width having different thicknesses corresponding to different thicknesses of the final molded product. Initially the composition is formed into a mat which has a thickness at least equal to the thickest portion of the preform, and then excess material is removed from across the width of the mat by scalping rolls to develop the contoured preform having different thicknesses. Each section of the mat having a different thickness is weighed separately to insure proper density of that section of the mat. Following the weighing step, the mat is again shaped into the contoured preform and placed into a mold for a subsequent heating and pressing operation.

3,663,138

HYDRAULICALLY CONTROLLED DRILL UNIT

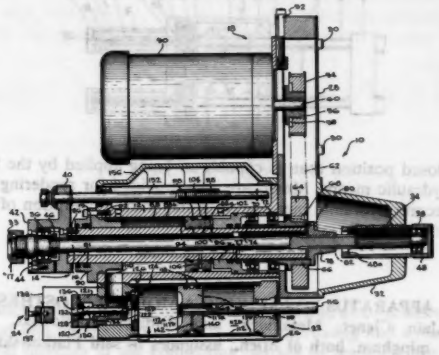
Robert J. Petroff, 1703 S. Main St., Lombard, Ill.

Filed Aug. 13, 1970, Ser. No. 63,569

Int. Cl. B23b *47/22*

U.S. Cl. 408—130 **7 Claims**

A drill unit adapted for controlled axial movement of a rotatable drill is hydraulically controlled so that the drill is rapidly advanced to the proximity of the workpiece and gradually fed into the workpiece. Large and small capacity flow control means are provided to regulate the rate of flow of a substantially non-compressible fluid from a quill and spindle assembly to fluid receiving means thereby controlling the rate of movement of the drill. Means are provided for



forming a smooth bottom in the hole prior to retraction of the drill and for preventing intermixture of the substantially non-compressible fluid with compressed gas used in advancing and retracting the drill.

3,663,139

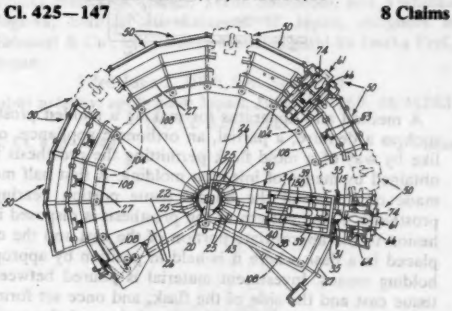
APPARATUS FOR MOLDING PLASTIC ARTICLES

John E. Robbins; William F. Willbond; Kingsley J. Tutt; Dennis S. Hall, and Raymond Hanson, all of Leicester, England, assignors to USM Corporation, Flemington, N.J.

Filed Apr. 20, 1970, Ser. No. 29,879

Int. Cl. B29f *1/10; A43d 35/00*

U.S. Cl. 425—147 **8 Claims**



Apparatus for molding articles of plastic material having a signal device on a mold indicating its volume and controlling the volume of material injected into the mold. The volume of material injected is further variable to vary the density of articles formed in the mold.

3,663,140

HYDRAULIC ARRANGEMENT FOR INJECTION-MOLDING APPARATUS

Karl Hehl, Siedlung 183, 7291 Lossburg, Wurttemberg, Germany

Filed Apr. 29, 1969, Ser. No. 820,250

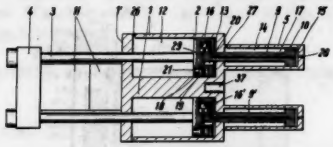
Claims priority, application Germany, June 22, 1968, P 17 78 952.5

Int. Cl. B29f *1/06*

U.S. Cl. 425—154 **33 Claims**

Injection-molding apparatus in which a mold means of two parts is moved between open and closed positions. The molding means is moved by a first hydraulic means. A second hydraulic means is also operatively associated with the mold

means and together with the first hydraulic means forms a single operating unit; such second hydraulic means being for applying a greater force to the mold means to hold it in its



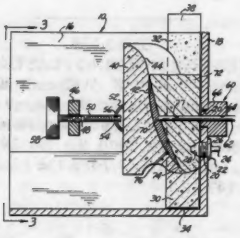
closed position than is capable of being applied by the first hydraulic means. Means are also provided for rendering the second hydraulic means inoperative during operation of the first hydraulic means.

3,663,141

APPARATUS FOR MAKING A MOLDED PROSTHESIS

Alain Clenet, Metamora, and Rudiger Piatkowski, Birmingham, both of Mich., assignors to said Piatkowski, by said Clenet

Filed Feb. 26, 1970, Ser. No. 14,580
Int. Cl. A61c *13/04*
U.S. Cl. 425—175 **5 Claims**



A method and apparatus for making a molded prosthesis such as a denture, a partial, an orthondic appliance, or the like by way of a mold flask permitting the prosthesis to be obtained by means of injection molding. A first half mold is made of a cast of the buccal tissue portion bearing the prosthesis, a wax pattern of the prosthesis is disposed in adhesion to the appropriate portion of the cast and the cast is placed in a flask where it is held in position by appropriate holding means. Investment material is poured between the tissue cast and the side of the flask, and once set forms the second half of the mold. The two halves of the mold are removed from the flask and the wax pattern is removed. The two halves of the mold are returned to the flask and held in appropriate registration, and an appropriate hardenable fluid material is injected into a gate into the cavity resulting from the removal of the prosthesis pattern and the material allowed to set to a solid form, thus providing the molded prosthesis. The molded prosthesis requires very little, if any, finishing work for providing an accurately fitted denture, partial, orthondic appliance, or other prosthetic part.

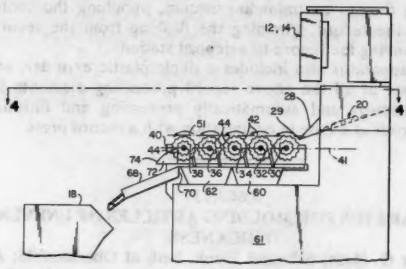
3,663,142

PLASTIC INJECTION MOLDING SYSTEM

Ralph Joseph Cafarelli, Clinton, Mass., assignor to Nylon Products Corp., Clinton, Mass.

Filed Feb. 27, 1970, Ser. No. 14,953
Int. Cl. B29f *1/00*
U.S. Cl. 425—217 **1 Claim**

A plastic injection molding system for molding workpieces with a connecting plastic tree, including a molding runner and with planar dimensions much greater than the workpieces, and for separating the workpieces from the trees employs plastic injection molding means for producing the workpieces and detached trees, discriminating means, with a surface for separating the workpieces from the trees, and



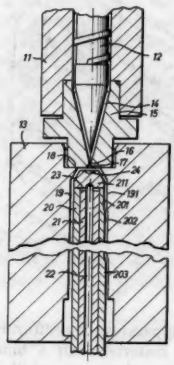
conveying and aligning means for conveying the workpieces and the trees from the molding means to the discriminating means and for aligning the runners with the surface.

3,663,143

APPARATUS FOR MAKING HOLLOW ARTICLES

Stefan Fischer, Lohmar, Bezirk, Cologne, Germany

Filed Jan. 28, 1970, Ser. No. 6,520
Claims priority, application Germany, Jan. 28, 1969, P 19 04 034.7
Int. Cl. B29c *5/06*
U.S. Cl. 425—244 **10 Claims**



This invention relates to a method and an apparatus for the production of hollow articles from thermoplastic synthetic plastic material.

3,663,144

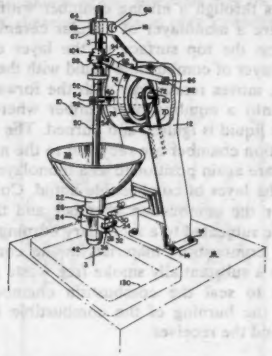
AUTOMATIC PASTRY FORMING APPARATUS

Melvin D. Pendleton, 13607 S.E. 192nd, Renton, and Arthur C. Pendleton, 10766 68th Ave. S., Seattle, both of Wash.

Filed May 12, 1970, Ser. No. 36,635
Int. Cl. A21c *11/16*
U.S. Cl. 425—287 **8 Claims**

Apparatus including a pastry dough storage bowl having a pastry forming cylinder extending downwardly therefrom, and a pair of pistons mounted on concentric piston rods adapted to move in and out of the distal ends of the pastry forming cylinder drawing pastry dough in at one end and extruding out formed pastries at its other end. Cam track and follower means training the movement of the pistons in and out of the pastry forming cylinder such that a partial vacuum is formed within the cylinder which tends to accelerate the movement of pastry dough from the pastry dough storage

bowl into the pastry forming cylinder. Additionally, a spring control is provided to regulate the movement of one of the



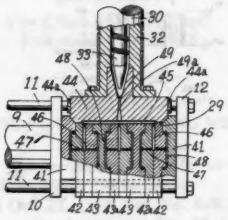
pistons within the pastry forming cylinder to control the size of the individual pastry formed.

3,663,145

SYNTHETIC RESIN INJECTION MOLDING APPARATUS

Shoichi Teraoka, 2 of 3676 Kanmura-cho, Fukuyama, Hioshi Prefecture, Japan

Filed Dec. 26, 1968, Ser. No. 787,087
Int. Cl. B29f *1/00*
U.S. Cl. 425—250 **4 Claims**



An injection molding apparatus comprising mold supporting plates to support molds on both sides, a group of molds having passages for plasticized material leading to cavities arranged on said fixed mold supporting plates, a clamping device provided with a movable mold platen to open and close said molds, and an injection device which may advance and retreat in the direction meeting at right angles with the opening and closing direction of said molds, in which plasticized material is injected into cavities, passing through said runner between said head and said molds and into said mold runner and T gate to said cavities.

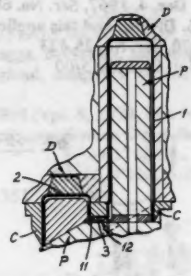
3,663,146

APPARATUS FOR FORMING A PLASTIC CONTAINER

William Arthur Roffey, and Austin Leslie Fox, both of London, England, assignors to Molins Machine Company Limited, London, England

Continuation-in-part of application Ser. No. 532,652, Mar. 8, 1966, now abandoned. This application Nov. 5, 1969, Ser. No. 874,211
Int. Cl. B29c *17/04, 17/10*
U.S. Cl. 425—301 **8 Claims**

A tool assembly is disclosed for forming a plastic container having a hinged lid which is produced from a single sheet of plastic material. The tool comprises two die members, one of which comprises two cavities over which a plastic sheet is laid and a second die member for cooperation therewith for vacuum forming the two container portions in the conventional manner with a connecting portion of plastic sheet material therebetween. At least one of the die members includes cutting members for separating the formed container



from the remainder of the sheet material and also includes at least one elongated projection for compressing and causing local thinning in the connecting portion to form a hinge as the dies move together.

ERRATUM

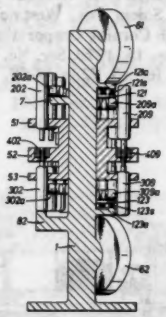
For Class 425—327 see:
Patent No. 3,663,151

3,663,147

ROTARY PRESS-MOLDING APPARATUS

Hideyuki Maekawa, Osaka; Teruo Sakamoto, and Yoshihisa Sagawa, both of Hirakata, all of Japan, assignors to Shionogi & Co., Ltd., Dosho-Machi Higashi-ku Osaka Pref., Japan

Filed June 2, 1970, Ser. No. 42,687
Claims priority, application Japan, June 12, 1969, 44/46583
Int. Cl. B29c *3/02*
U.S. Cl. 425—345 **1 Claim**



A combination, provided in a conventional punch-and-die type rotary tableting machine, of auxiliary rollers attached to each of the punches or the sheathes thereof, and tracking rails capable of exerting pressure on said punches through said auxiliary rollers with sequential transferring of the punches, serves to cause auxiliary (preparatory and complementary) compacting of material to be molded or of already molded articles resulting in a tableting performance free of capping or lamination.

3,663,148

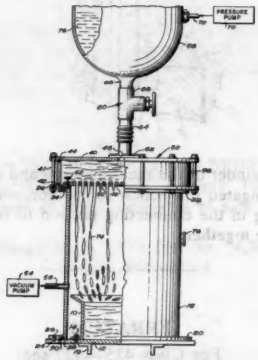
PRESSURE CASTING APPARATUS

Lloyd A. Walker, Placerville, and Rudolph A. Peterson, Rancho Gordova, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Original application Dec. 4, 1967, Ser. No. 687,651, now Patent No. 3,600,486. Divided and this application Apr. 3, 1970, Ser. No. 25,423

Int. Cl. B29c *5/00*

U.S. Cl. 425—405 4 Claims



A pressure casting apparatus for casting highly viscous material having a casting mold within a vacuum bell, whereby the vacuum prevents voids in the cast material and reduces the pressurization otherwise required on a transfer pot containing the material to be cast. The transfer pot is operably connected to a pressure casting head having pattern holes in the bottom thereof, which casting head forms the top of the vacuum bell above the casting mold. The casting process is performed by drawing a vacuum in the bell, pressurizing the transfer pot, forcing the material from the transfer pot through the casting head, and dropping the extruded material into the casting mold for curing.

3,663,149

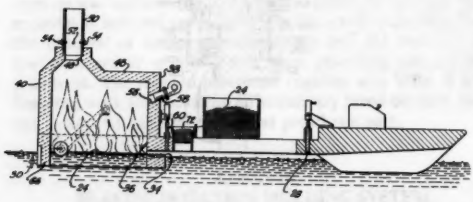
METHOD AND APPARATUS FOR REMOVING A LAYER OF COMBUSTIBLE LIQUID FROM THE SURFACE OF A BODY OF WATER

Richard B. Heagler, Salem Tsp., Westmoreland Co., Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed Nov. 16, 1970, Ser. No. 89,617

Int. Cl. F23q *13/00*

U.S. Cl. 431—2 10 Claims



A generally U-shaped, buoyant, self-propelled vessel floats partially submerged in a body of water and has a longitudinal channel portion with a front opening. The vessel has an open bottom portion beneath the longitudinal channel portion. As the vessel advances into a body of water, a band of water with the layer of combustible liquid floating thereon, enters the channel portion of the vessel. The rate at which the combustible liquid, as a layer, enters the channel portion of the vessel is dependent on the forward speed of the vessel and the speed is controlled so that substantially all of the layer of combustible liquid is removed by burning before the band of water psses under the rear portion of the vessel. As the vessel advances, the band of water with the layer of combustible liquid moves through a mixing chamber within the channel portion where a monolayer of cellular ceramic nodules are positioned on the top surface of the layer of combustible liquid. The layer of combustible liquid with the nodules floating thereon, moves rearwardly with the forward advance of the vessel into a combustion chamber where the layer of combustible liquid is ignited and burned. The nodules within the combustion chamber are recycled to the mixing chamber where they are again positioned as a monolayer on the upper surface of the layer of combustible liquid. Combustion air is provided for the combustion chamber and the combustion gases may be subjected to a secondary burning in the stack to remove the combustible materials in the combustion gases and provide a substantially smoke-free waste gas. Apparatus is provided to seal the combustion chamber and mixing chamber if the burning of the combustible liquid tends to spread beyond the receiver.

3,663,150

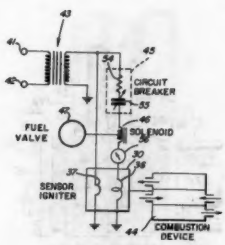
SAFETY IGNITION CONTROL SYSTEM

William H. Hapgood, Brookline, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation-in-part of application Ser. No. 772,559, Nov. 1, 1968, now abandoned. This application Jan. 23, 1970, Ser. No. 5,439

Int. Cl. F23n *5/14*

U.S. Cl. 431—66 15 Claims



A control system for use in combination with any combustion type heating device to provide a fail-safe safety ignition system. A voltage source, circuit breaker, igniter, electrically actuated fuel source control means and serially connected ignition sensing means, of a material having a high positive temperature coefficient of electrical resistance, are incorporated in the system. The current due to varying resistance of the sensing means will develop from a high initial value to a lower average normal running current value upon satisfactory ignition. The system parameters are selected to automatically disconnect the fuel source in the event of a failure in the combustion cycle. The circuit which includes the sensing means may also include a temperature indicating device.

3,663,151

APPARATUS FOR USE IN FORMING PIPES

Malcolm Sykes, Lanark, England, assignor to London and Russell Limited, Newmains, Wishaw, England

Filed Oct. 30, 1969, Ser. No. 872,488

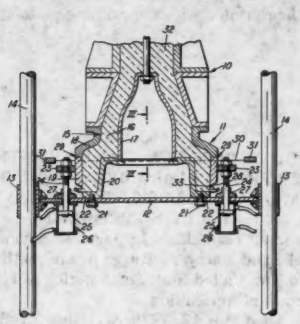
Claims priority, application Great Britain, Nov. 26, 1968, 55,995/68

Int. Cl. B28b *21/54*

U.S. Cl. 425—327 6 Claims

In an extruder for manufacturing clay pipes, a socketed end portion of each pipe is formed by an annular mould which is positioned at the extruder outlet during moulding

and withdrawn after moulding to permit extrusion of the pipe. The shoulder portion of the mould is attached to the extruder mouth, whereas the mould core and the mould side-wall are withdrawable, the side-wall being movable axially relative to the core by means of pneumatic actuators so that a downward movement of the side-wall may be effected for the purpose of shearing off waste clay extruded through a



gap between the lower end of the side-wall and an outwardly presented flange on the core. Where the extruder is adapted to produce bends, the rapid withdrawability of the side-wall allows increased production rate in respect of "quick bends." The removal of waste clay extruded through the mould is effected more rapidly than hitherto in the production of both straight pipes and bends.

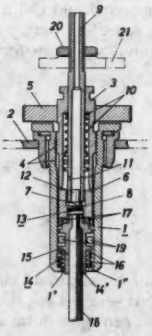
ERRATUM

For Class 431—307 see:
Patent No. 3,663,128

3,663,152
AUTOMATIC FLAME ADJUSTING MEANS IN A LIGHTER

Choju Yoshida, Tokyo, Japan, assignor to Zenza Bronica Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1969, Ser. No. 868,306
Claims priority, application Japan, Oct. 25, 1968, 43/77400
Int. Cl. F23d *13/04*
U.S. Cl. 431—344 **5 Claims**

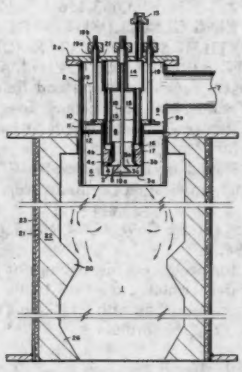


In a lighter of the gas fuel type, a resilient porous filter means provided in a fluid passageway connecting a reservoir with a burner nozzle is contracted or expanded by a member automatically actuated towards or against said filter means in response to changes of pressure inside said reservoir, thereby flow of fluid vaporized by the filter means and ejected into the burner nozzle is controlled constant independently of changes of pressure in the reservoir. The density of porosity of said filter means is not only adjustable by said automatically actuated member but also adjustable by a manual operation, if desired.

3,663,153
COMBUSTION DEVICE FOR GASEOUS FUEL

Leonard P.. Bagge, Berkshire, and Robert W. Kear, London, both of England, assignors to Shell Oil Company, New York, N.Y.

Filed Sept. 8, 1970, Ser. No. 70,163
Claims priority, application Great Britain, Sept. 5, 1969, 44,170/69
Int. Cl. F23d *15/00*
U.S. Cl. 431—351 **9 Claims**

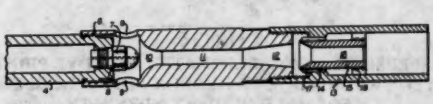


A combustion device for gaseous fuel, such as LPG, of the type having a coaxial burner opening into combustion chamber having an open downstream end. An annular supply for primary air and fuel issues into the bottom of flame chamber which is surrounded by an annular supply for secondary air. Means, such as a baffle are provided for subdividing the combustion air from a single source into determined proportions of primary and secondary air and means are providing for decreasing the velocity of the secondary air stream with respect to the velocity of the primary air stream.

3,663,154
BLOW TORCH BURNER

Joseph K. Locke, DeKalb, Ill., assignor to Bernzomatic Corporation, Rochester, N.Y.

Original application July 29, 1968, Ser. No. 748,436, now Patent No. 3,574,506. Divided and this application June 24, 1970, Ser. No. 59,831
Int. Cl. F23d *15/02*
U.S. Cl. 431—353 **6 Claims**



A blow torch burner having a section formed as a jet pump which leads into a cylindrical sleeve provided with a flame holder. A gas conduit with a gas flow orifice leads into the inlet section of the jet pump, which is provided with peripheral air inlet ports, the orifice constituting the nozzle of the pump. The flame holder in connection with the construction producing a pencil-type flame has a central axial passage and a peripheral gas flow passage with a greater cross-sectional area at its exit than at its inlet in order to provide a mantle of slower moving gas. In connection with a utility-type flame, the flame holder has a central diverter with peripheral gas flow passages extending therearound.

3,663,155

STAINING PLASTIC SURFACES

Don N. Gray, Okemos, and Bruce M. Mueller, Ottawa Lake, both of Mich., assignors to Owens-Illinois, Inc.

Filed Sept. 30, 1968, Ser. No. 763,937
Int. Cl. D06p 5/04
U.S. Cl. 8—4 9 Claims

Plastic articles are provided with sub-surface markings which are scuff-proof and resistant to acid, alkali and solvent attack; a staining composition which includes a dye and a sublimable or pyrolyzable carrier is applied to the article and the article is heated whereby the dye penetrates and diffuses into the article and the carrier is volatilized.

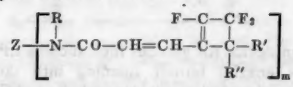
3,663,156

FAST DYEING CELLULOSE FIBROUS MATERIALS WITH REACTIVE WATER-SOLUBLE TRIFLUOROCYCLOBUTENYL AZO DYES

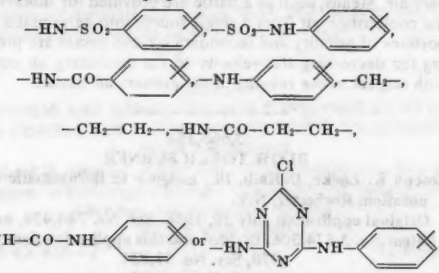
Fritz Meininger, Frankfurt/Main, and Helmold Von Plessen, Hofheim/Taunus, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Aug. 7, 1968, Ser. No. 750,779
Claims priority, application Germany, Aug. 12, 1967, P 16 19 543.0; F53217
Int. Cl. C09b 29/34; D06p 3/60
U.S. Cl. 8—54.2 10 Claims

A process for producing fast dyeings or prints on cellulose fibrous materials, which comprises treating the said fibrous materials in any sequence with an alkaline agent and a water-soluble dyestuff of the formula



in which Z represents the radical of a water-soluble organic dyestuff molecule being linked to the identified side grouping directly or via the bridging member



R represents hydrogen or lower alkyl, R′ and R″ represent hydrogen, lower alkyl or phenyl and m represents the integer 1 or 2.

3,663,157

DISPERSE OR MONOSULFONATED ACID DYE PRINTED NYLON RESISTED WITH HYDROXY DIARYL SULFONE-FORMALDEHYDE CONDENSATE

Heinz Gilgien, Riehen; Gerhard Koegel, Reinach, and Melvin Harris, Arlesheim, all of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed May 31, 1967, Ser. No. 642,304
Claims priority, application Switzerland, June 3, 1966, 8088/66
Int. Cl. D06p 5/12
U.S. Cl. 8—65 10 Claims

A process for printing synthetic nitrogenous fibers with dyestuff that are soluble or dispersible in water is disclosed. The fibers to be printed are pretreated with an aqueous preparation consisting substantially of at least one fiber, substantive water-soluble, anionic resist for synthetic polyamide fibers selected from the group consisting of polycondensates of diarylsulfones containing at least one phenolic hydroxy group with formaldehyde. The fibers so pretreated are then dried and then printed with the printing paste containing the dyestuff.

3,663,158

METHOD OF DEPOSITING AN OXYMETHYLENE POLYMER FROM FORMALDEHYDE IN THE VAPOR FORM ON CELLULOSIC TEXTILES AND THE RESULTING PRODUCT

Walter Brenner, Teaneck, N.J.; Jagadish Chanda Goswami, New York, and Barry A. Rugg, Bronx, both of N.Y., assignors to The United States of America as represented by the Secretary of Agriculture

Filed May 12, 1970, Ser. No. 23,163
Int. Cl. D06m 13/14, 13/54, 13/42
U.S. Cl. 8—116.4 4 Claims

Highly purified anhydrous monomeric formaldehyde vapor was prepared for immediate deposition on the surface of fibers of cotton. The process produced fabrics with enhanced physical properties with the deposition of oxymethylene polymer with molecular weights up to 18,000 and without significant crosslinking of the cellulosic chains. Supplementary treatments were applied to the oxymethylene polymer treated fabrics to further enhance the textiles with various desirable "wash-wear" characteristics.

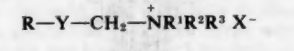
3,663,159

PRESS-FREE GARMENT PRODUCTION

Alex F. Gordon, Black Mountain, N.C., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 542,742, Apr. 15, 1966, now Patent No. 3,458,869. This application Apr. 2, 1969, Ser. No. 812,873
Int. Cl. D06m 15/56, 15/58, 15/54
U.S. Cl. 8—116.3 18 Claims

Press-free garments are produced by treating a fabric with a mixture of (A) an aldehyde donor compound comprising an amine-aldehyde compound and (B) a synergistic catalyst comprising (1) an acid salt of a primary aliphatic amine and (2) a quaternary ammonium salt of the formula:



wherein R is an aliphatic hydrocarbon chain of 12 to 18 carbon atoms, Y is —CONH— or —O—, R^1, R^2 and R^3 are alkyl groups or with the nitrogen atom form a substituted or unsubstituted heterocyclic ring and X^- is a halogen atom or mineral acid radical; or an alkylaryl N-alkyl sulfonamide. The treated fabric is then partially dried, cut, sewn, pressed and/or creased to form the garment and then cured at an elevated temperature; or dried, cured and then cut and sewn into the garment.

3,663,160
TREATMENT OF TEXTILE MATERIALS

Eric William Stone, and Wilfred Arthur Stephen White, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 14, 1967, Ser. No. 690,387
Claims priority, application Great Britain, Dec. 29, 1966, 58,159/66
Int. Cl. B08b *3/08*
U.S. Cl. 8—137 8 Claims

Solvent laden textile materials are passed through a steam chamber and thereafter a hot water bath to remove the solvent therefrom. The combination of steam and hot water, in that sequence of steps, mitigates difficulties heretofore experienced in the art and improves the efficiency of processes for removing solvents from textiles.

3,663,161
PROCESS FOR CONTINUOUS DYEING POLYACRYLONITRILE TEXTILE MATERIAL FOR A HYDROPHOBIC SOLVENT DYEBATH

Alfred Litzler, Itingen; Visvanathan Ramanathan, Basel; Gert Hegar, Schoenenbuch; Eugen Johann Koller, Oberwil, and Branimir Milicevic, Riehen, all of Switzerland, assignors to Ciba Limited, Basel, Switzerland

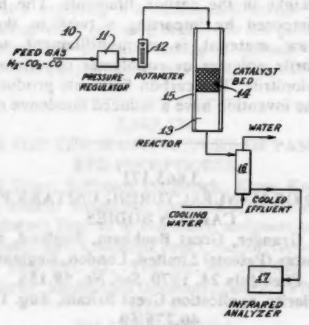
Filed June 30, 1969, Ser. No. 837,926
Claims priority, application Switzerland, July 1, 1968, 9807/68
Int. Cl. D06p *1/68*
U.S. Cl. 8—174 12 Claims

A process for dyeing textile material based on aromatic polyester fibers or acrylic fibers, wherein the textile material is impregnated with a solution containing at least one basic disperse dyestuff in an organic solvent and the dyestuff is fixed on the fiber by heat.

3,663,162
METHOD FOR SELECTIVE METHANATION OF GASEOUS MIXTURE CONTAINING CARBON MONOXIDE

Sarabjit Singh Randhava, Chicago, Ill., assignor to Institute of Gas Technology

Filed June 24, 1969, Ser. No. 836,047
Int. Cl. B01d *53/34;* C01b *1/30*
U.S. Cl. 23—2 S 6 Claims

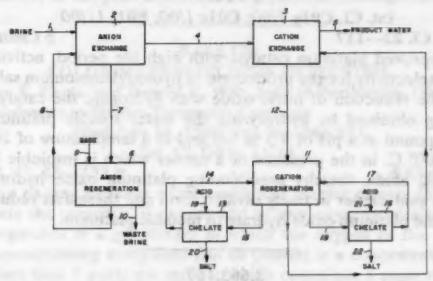


A method for the selective methanation of a gaseous mixture containing hydrogen, carbon dioxide, and carbon monoxide with the carbon monoxide being present in an amount up to about 1 percent, which contemplates the contacting of said gaseous mixture with a Raney-type nickel catalyst containing from about 30–35 percent nickel, 5–18 percent aluminum, and balance $Al_2O_3 \cdot 3H_2O$; at elevated temperatures.

3,663,163
REGENERATION OF CATION EXCHANGE RESINS AND RECOVERY OF SALTS

David O. De Pree, Loomis, and Herman H. Weyland, Folsom, both of Calif., assignors to The United States of America as represented by the Secretary of the Interior

Filed May 18, 1970, Ser. No. 38,244
Int. Cl. B01d *15/04, 15/06, 15/08*
U.S. Cl. 23—63 20 Claims



Cation exchange resins are regenerated by contact with selective chelating agents dissolved in an organic solvent. The chelating agents in turn are regenerated by acidification to precipitate a meal salt.

3,663,164
CRYSTALLINE ZEOLITE AND METHOD OF PREPARATION

Richard M. Barrer, Bromley, England; John F. Cole, Amsterdam, Netherlands, and Hans Sticher, Zug, Switzerland, assignors to Air products and Chemicals, Inc., Wayne, Pa.

Filed Oct. 8, 1969, Ser. No. 864,908
Claims priority, application Great Britain, Oct. 11, 1968, 48,309/68
Int. Cl. C01b *33/28*
U.S. Cl. 23—112 2 Claims

Crystalline zeolites are prepared by reacting raw kaolinite with aqueous alkali metal hydroxide solutions at temperatures between 80° to 140° C.

3,663,165
ZEOLITIC CATALYST AND PREPARATION

Walter L. Haden, Jr., Metuchen, and Frank J. Dzierzanowski, Somerset, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Woodbridge, N.J.

Continuation-in-part of application Ser. No. 738,384, June 20, 1968, now Patent No. 3,506,594, and 810,325, Mar. 25, 1969, and 856,458, Sept. 9, 1969; said 738,384, , which is a continuation-in-part of application Ser. No. 698,400, Jan. 17, 1968, now Patent No. 3,503,900, and 416,925, Dec. 8, 1964, now Patent No. 3,391,994. This application Feb. 9, 1970, Ser. No. 10,005. The portion of the term of the patent subsequent to Apr. 14, 1987, has been disclaimed.
Int. Cl. C01b *33/23;* B01j *11/40*
U.S. Cl. 23—112 7 Claims

Preformed coherent microspheres obtained by calcining a spray dried slurry of hydrated kaolin clay at elevated temperature (e.g., 1800° F.) are suspended in an aqueous sodium hydroxide solution together with a small amount of finely divided metakaolin (e.g., kaolin clay calcined at 1350° F.). The suspension is aged and then heated until crystalline sodium faujasite appears in the microspheres and a sodium silicate mother liquor is formed. The crystallized microspheres are ion-exchanged to produce a fluid zeolitic cracking catalyst.

3,663,166

PLATINUM CATALYST FOR THE PRODUCTION OF HYDROXYLAMINE

Johannes Weise, Krefeld-Bockum; Hans Zirnglbl, Duisburg, and Heinz Heine, Krefeld-Uerdingen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Original application May 8, 1968, Ser. No. 727,664, now abandoned. Divided and this application July 30, 1970, Ser. No. 59,718

Claims priority, application Germany, May, 13, 1967, F 52 408

Int. Cl. C01g *1/00;* **C01c** *1/00;* **B01j** *11/00*

U.S. Cl. 23—117 **5 Claims**

Improved platinum catalyst with high life period, activity and selectivity for the production of hydroxylammonium salts by the reduction of nitric oxide with hydrogen, the catalyst being obtained by hydrolyzing the water soluble platinum compound at a pH of 4.5 to 9.0 and at a temperature of 20° to 100° C. in the presence of a carrier which is insoluble in strong acids, thereby precipitating platinum oxide hydrate onto said carrier in finely divided form and thereafter reducing the platinum oxide hydrate to metallic platinum.

3,663,167

MANUFACTURE OF HIGH PURITY NITRIC OXIDE

Frank E. De Vry, Greenville, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of application Ser. No. 731,959, May 24, 1968, now abandoned. This application Sept. 21, 1970, Ser. No. 74,076

Int. Cl. C01b *21/26*

U.S. Cl. 23—157 **9 Claims**

Process, integrated with ammonia air oxidation, for the manufacture of nitric oxide of at least 99 percent purity comprising the steps of (1) effecting the ammonia oxidation, (2) maintaining maximum NO content in the oxidation effluent, and then contacting the effluent with nitric acid to convert the NO to NO_2, (3) cooling the NO_2 containing gas product to condense the NO_2 therefrom as liquid N_2O_4, (4) passing the liquid N_2O_4 into a packed converter tower and therein at least partially vaporizing the liquid; passing resulting vaporization product upwardly through the tower packing and passing water or weak nitric acid into the tower and downwardly through the packing in countercurrent flow reaction contact with the vaporization product, and then into the zone of said vaporization and reaction contact with any unvaporized liquid, and vaporization product — to convert substantially all of the initially added liquid dinitrogen tetroxide to nitric oxide gas product containing minor contaminant amounts of NO_2, HNO_3 and water, (5) water-scrubbing the NO_2 and HNO_3 contaminants from the NO gas product to form resulting water-wet NO gas product containing, on an anhydrous basis, at least 99 percent NO, and (6) dehydrating the water-wet NO gas product to form said NO of at least 99 weight percent purity. Strong nitric acid is formed in the converter tower as by-product.

3,663,168

METHOD OF PRODUCING CONCENTRATED PHOSPHORIC ACID

Allen G. Rubin, Walnut Creek, and Nicholas Kalmar, Berkeley, both of Calif., assignors to B. D. Bohna & Company, Inc., San Francisco, Calif.

Filed July 3, 1969, Ser. No. 838,964

Int. Cl. C01b *15/18, 25/28, 25/22, 25/30*

U.S. Cl. 23—165 **7 Claims**

Monocalcium phosphate, advantageously in the form of single superphosphate or triple superphosphate, is mixed with sulfuric acid or ammonium bisulfate and methanol. The monocalcium phosphate and the sulfuric acid or ammonium bisulfate react to form phosphoric acid and a precipitate which contains calcium sulfate. The phosphoric acid is substantially entirely dissolved in the methanol. Next the methanol containing the dissolved phosphoric acid is separated from the solid precipitate by decantation, filtration or centrifugation. By evaporation of the methanol a phosphoric acid concentrate is obtained, or by the addition of a base to the methanolic acid solution, the corresponding phosphate salts are formed and precipitated in an easily separatable and dryable form.

3,663,169

METAL SEPARATION

James Barrie Scuffham, Teesside, and George Allan Rowden, Stockton-on-Tees, both of England, assignors to Power-Gas Limited, London, England

Filed May 5, 1970, Ser. No. 34,854

Claims priority, application Great Britain, May 8, 1969, 23419/69

Int. Cl. C01g *49/02*

U.S. Cl. 23—200 **9 Claims**

In the present process a first metal value of a metal of which the hydroxide is insoluble is separated from a salt of the first metal and a salt of the second metal which forms a soluble ammine. The mixture is passed through an inert liquid barrier into ammonium hydroxide where the first metal is precipitated as its hydroxide and the second remains in solution as an ammine. Preferably the mixture is dripped through the liquid barrier into ammonium hydroxide below it.

3,663,170

MANUFACTURE OF CARBON FILAMENTS

John J. Tatchell, Maidenstone, Kent, England, assignor to Morganite Research & Development Limited, London, England

Filed Jan. 31, 1969, Ser. No. 795,719

Claims priority, application Great Britain, Feb. 21, 1968, 5,354/68

Int. Cl. C01b *31/07*

U.S. Cl. 23—209.4 **3 Claims**

A process is disclosed for the production of carbon filaments having a very high modulus of elasticity which have utility as structural materials.

The process comprises the carbonization and pyrolysis of a filamentary material capable of carbonization with maintenance of its filamentary structure to temperatures above 900° C in which the filamentary material is a multifilament tow and this is heated up to a temperature of at least about 900° C under conditions of imposed linearity to reduce incidence of kinks in the carbon filaments. The linearity is preferably imposed by imparting a twist to the tow. A preferred raw material is a multifilament tow of a polyacrylonitrile polymer or copolymer containing at least 85% of acrylonitrile. The carbon filaments produced by the process of the invention have a reduced incidence of kinks.

3,663,171

METHOD OF MANUFACTURING UNITARY POROUS CARBON BODIES

Anthony F. Granger, Great Bookham, England, assignor to Coal Industry (Patents) Limited, London, England

Filed July 24, 1970, Ser. No. 58,151

Claims priority, application Great Britain, Aug. 12, 1969, 40,276/69

Int. Cl. C01b *31/08;* **B29c** *25/00*

U.S. Cl. 23—209.1 **7 Claims**

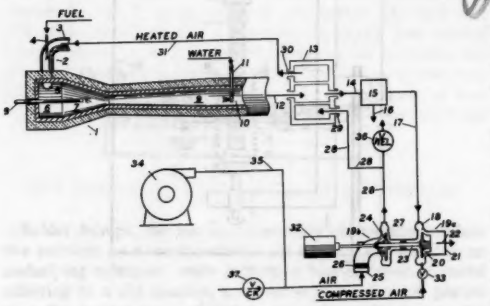
A method for the manufacture of the porous carbon body comprises sintering a particulate pitch-like material, for example an extract or solution of coal, at a temperature below that at which the material melts to produce a green compact, oxidizing the green compact to stabilize the green compact to heat treatment, and carbonizing the stabilized green compact.

3,663,172

CARBON BLACK PRODUCTION PROCESS

Richard Wigmore Foster-Pegg, Warren, Pa., assignor to Cities Service Company, New York, N.Y.

Filed June 29, 1970, Ser. No. 50,533
Int. Cl. C09c *1/48*; C10b *47/00*
U.S. Cl. 23—209.4 13 Claims



A hot aerosol of carbon black is discharged from a furnace into a turbocharger, thus driving the latter. The compressor stage of the turbocharger supplies air to the furnace. The economics of the process are improved because the production rate of carbon black is greatly increased while the energy requirement for supplying air to the furnace is obtained from heat rejected from the process in place of purchased electric power.

3,663,173

PROCESS FOR PRODUCING CARBONIZED FIBROUS PRODUCTS

Stanley E. Ross, Passaic, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed May 31, 1968, Ser. No. 733,516
Int. Cl. C01b *31/07*
U.S. Cl. 23—209.4 4 Claims

Carbonized textile products having both improved tensile strength and modulus of elasticity properties are produced by heating a cellulosic textile substrate until a first carbonized textile product of at least 50 percent by weight carbon is produced and exposing the carbonized textile product to further heating while applying tension to the product until a second carbonized product having a carbon content of between 60–100 percent by weight carbon is produced.

3,663,174

PROCESS FOR THE MANUFACTURE OF PASSIVATED RED PHOSPHORUS

Franz-Josef Dany, Erftstadt Lechenich; Klaus Komorniczyk, Turnich; Hilmar Roszinski, Kendenich, and Gerhard Kalteyer, Erftstadt Erp, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany

Filed Dec. 22, 1970, Ser. No. 100,846
Claims priority, application Germany, Jan. 2, 1970, P 20 00 033.3
Int. Cl. C01b *25/04*
U.S. Cl. 23—223 10 Claims

Production of passivated red phosphorus. Between about 10 and 85 weight percent powdered red phosphorus having a particle size of up to 100 microns is treated with between about 90 and 15 weight percent of molten ϵ-caprolactam, under inert gas; the resulting homogeneous and phosphorus-containing blend is cooled in a suitable cooler until solid; and solidified material in the form of lumps or scale is removed from the cooler.

3,663,175

METHOD OF DETERMINING HEMOGLOBIN IN BLOOD

Edward L. Depositar, Indianapolis; Robert K. Shipley, Muncie, and David T. Santore, Indianapolis, all of Ind., assignors to Bio-Dynamics, Inc., Indianapolis, Ind.

Filed Oct. 5, 1970, Ser. No. 78,159
Int. Cl. G01n *33/16, 31/22, 21/24*
U.S. Cl. 23—230 B 5 Claims

A method of determining hemoglobin in blood using Drabkin's reagent wherein acetone is added to the reagent as a loss of color inhibitor and to aid in attaining immediate recovery of the peak absorbance of cyanmeth-hemoglobin.

3,663,176

COLORIMETRIC OXYGEN DETECTORS

Glen E. Cagle, and Donald R. Witt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed July 24, 1969, Ser. No. 844,637
Int. Cl. G01n *21/16*
U.S. Cl. 23—232 R 8 Claims

An oxygen detector which undergoes a color change to indicate the presence of oxygen and certain oxygen-containing compounds in a gas stream in which the oxygen or the oxygen-containing compound can be present in a concentration of less than 1 parts per million which comprises a supported oxide of a metal of group VB or VIB of the periodic table, the metal being in a lower valence state.

3,663,177

RADIOACTIVE BARIUM-137

Hirofumi Arino, Suffern, and Vincent D. Reardon, Harverstraw, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 28, 1968, Ser. No. 755,820
Int. Cl. B01d *59/30*; A61k *27/04*; C09k *3/00*
U.S. Cl. 23—252 R 7 Claims

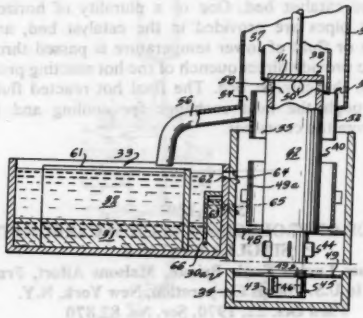
Radioactive barium-137m is obtained by eluting a generator comprised of the parent isotope, cesium-137, on a cobalt (II) ferrocyanide substrate.

3,663,178

MIXER-SETTLER APPARATUS

William E. Miller, Naperville; James B. Knighton, Joliet, and George J. Bernstein, Park Forest, all of Ill., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed June 3, 1969, Ser. No. 829,945
Int. Cl. B01f *7/00*
U.S. Cl. 23—267 R 4 Claims



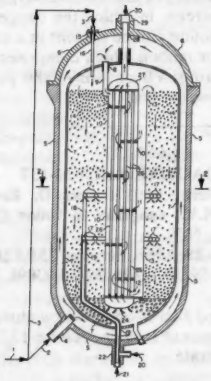
Apparatus for simultaneously mixing and separating multiple phase fluids in which one phase is retained as a batch phase and the other phases are continuously flowing. A pump-mixer continuously mixes the fluids and pumps them

into a settling chamber where they settle out and means are provided in the settling chamber for returning one phase to the mixer from which it came and transferring the other phases to another pump-mixer. Apparatus is provided for retaining as a batch or captive phase either heavy or light phases.

3,663,179
APPARATUS FOR EXOTHERMIC CATALYTIC REACTIONS

Dinshaw D. Mehta, New York, and Edward J. Miller, Woodhaven, both of N.Y., assignors to Chemical Construction Corporation, New York, N.Y.

Filed Apr. 20, 1970, Ser. No. 30,101
Int. Cl. B01j 9/04
U.S. Cl. 23—289 **4 Claims**



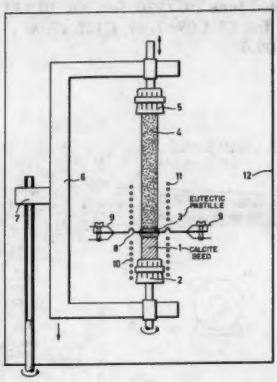
An apparatus is provided for catalytic ammonia or methanol synthesis, or for other exothermic catalytic reactions, in which the catalyst bed is mounted in a basket which is spaced from the wall of the high pressure container. Cold feed gas or other reaction fluid is circulated upwards between the container shell and the basket, to cool the container, then through an internal heat exchanger for further heating to catalysis temperature, and then downwards through the catalyst bed. One or a plurality of horizontal foraminous pipes are provided in the catalyst bed, and a second gas or fluid of lower temperature is passed through the pipes to provide direct quench of the hot reacting process fluid within the catalyst bed. The final hot reacted fluid is passed through the heat exchange for cooling and then removed from the container.

3,663,180
METHOD OF PRODUCING CALCIUM CARBONATE SINGLE CRYSTALS

Jean Jacques Lucien Emile Brissot, Maisons Alfort, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1970, Ser. No. 82,870
Claims priority, application France, Nov. 21, 1969, 6940146
Int. Cl. B01j 17/10, 17/14
U.S. Cl. 23—301 SP **5 Claims**

A method of producing calcite single crystals by floating-zone melting of a polycrystalline rod of calcium carbonate and an eutectic mixture, for example, of calcium carbonate and lithium carbonate which is introduced in the form of a pastille in contact with a seed crystal and which is displaced



in the molten state in the direction of length of the rod subject to the action of a moving temperature gradient.

3,663,181
ORTHORHOMBIC PLATINUM-METAL OXIDES OF TYPE PT_3MO_6

Robert D. Shannon, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 22, 1970, Ser. No. 48,500
Int. Cl. C01g 55/00
U.S. Cl. 23—315 **16 Claims**

Disclosed herein are orthorhombic platinum-metal oxides of the type Pt_3MO_6, wherein: M = Mn, Fe, Co, Ni, Cu, Zn, Mg, or Cd; and process for making these oxides which are catalysts for the hydrogenation of ethylene.

3,663,182
METAL OXIDE FABRICS

Bernard H. Hamling, Warwick, N.Y., assignor to Union Carbide Corporation

Continuation-in-part of application Ser. No. 576,840, Sept. 2, 1966, now Patent No. 3,385,915, which is a continuation-in-part of application Ser No. 320,843, Nov. 1, 1963, now abandoned , and a continuation-in-part of 700,031, Jan. 24, 1968. This application Mar. 29, 1968, Ser. No. 717,367
Int. Cl. C01g 1/00; C10f 1/00
U.S. Cl. 23—355 **10 Claims**

The specification discloses fabrics that are composed of metal oxides such as zirconia, tantala, and other metal oxides which have not heretofore been available in the form of fabrics. The metal oxide fabrics of this invention are characterized by being relatively flexible and strong, as well as exhibiting the desirable high temperature and chemical resistance properties that are typical of materials such as zirconia and tantala. The metal oxide fabrics of the invention are useful as battery separators, fuel cell separators, in high temperature insulation, and the like.

3,663,183
FLUORINE COMPOUND

James W. Dale, Winchester, Mass., assignor to Monsanto Research Corporation, St. Louis, Mo.

Filed Mar. 30, 1964, Ser. No. 356,356
Int. Cl. C01b 7/00
U.S. Cl. 23—367 **1 Claim**

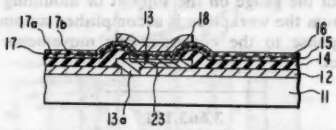
As a new compound, difluorochlorinium hexafluorobismuthate, of the formula ClF_2BiF_6.

3,663,184

SOLDER BUMP METALLIZATION SYSTEM USING A TITANIUM-NICKEL BARRIER LAYER

John Richard Wood, Sunnyvale, and John D. Wright, Mountain View, both of Calif., assignors to Fairchild Camera and Instrument Corp., Mountain View, Calif.

Filed Jan. 23, 1970, Ser. No. 5,445
Int. Cl. B32b 15/00
U.S. Cl. 29—195 4 Claims



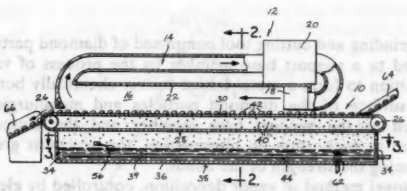
Solder bumps, for use in connecting electrically-conductive contacts on a semiconductor die to electrical leads on an underlying substrate, each include a barrier layer of metal adhering to a die contact, a wettable layer of metal placed over the barrier layer of metal, and solder adhering to the wettable layer of metal. In addition, an intermetallic layer is formed between the barrier metal and the wettable metal to increase the strength and diffusion resistance of each bump.

3,663,185

METHOD AND APPARATUS FOR DESENSITIZING CHARCOAL BRIQUETTE FINES

Frederick C. Mennen, Michigan City, Ind., assignor to United States Packaging Corporation, LaPorte, Ind.

Filed Apr. 2, 1970, Ser. No. 25,156
Int. Cl. C10l 5/24
U.S. Cl. 44—2 9 Claims



The method and apparatus for desensitizing charcoal briquette fines produced during drying of the briquettes which includes supporting the briquettes during the drying cycle upon means having openings therein through which said fines may fall. Providing a receptacle filled with a material which, upon contact with the fines, causes the desensitizing thereof. Positioning the receptacle under the briquette support means so as to catch the fines as they are dislodged from the briquettes and fall through the openings in the support means.

3,663,186

METHOD OF PRODUCING METALLURGICAL COKE

Platon Nesterovich Dzhaparidze, ulitsa Uplistsikhskaya, 2; Leonid Alexeevich Drakin, ulitsa Kominterna, 39, korpus 26, kv. 45, both of Tbilisi, and Sergei Ivanovich Malyshev, Panfilovsky pereulok, 3, kv. 37, Moscow, all of U.S.S.R.

Filed Jan. 27, 1970, Ser. No. 6,251
Int. Cl. C10l 5/00
U.S. Cl. 44—10 H 5 Claims

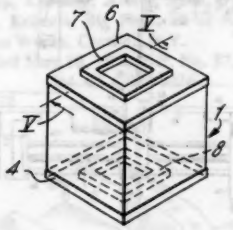
A method of manufacturing metallurgical coke, consisting in that poor-caking coal is ground, then molded at a temperature of 20°–350° C., whereupon the coal briquettes are caked at 450°–600° C. under the pressure of vapor and gaseous products of the coal thermal decomposition, and are then calcined at 750°–950° C.

3,663,187

ORCHARD HEATERS

Edward Barnes, Speldhurst, and Kenneth H. Nance, Bromley, both of England, assignors to BP Chemicals Limited, London, England

Filed July 8, 1970, Ser. No. 53,103
Claims priority, application Great Britain, July 8, 1969, 34,637/69; Sept. 28, 1969, 52,713/69
Int. Cl. A01g 13/06
U.S. Cl. 44—40 10 Claims



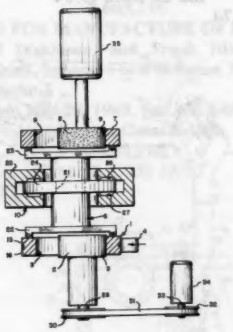
An orchard heater has sides of flame retardant material and base and cover of combustible material. The heater is filled with solid combustible composition eg. wax and the base and cover are so shaped that the heaters may be stacked vertically.

3,663,188

CAM CONTROL GRINDING MACHINE

Nils O. Hoglund, Short Hills, N.J., assignor to Tri-Ordinate Corporation, Berkeley Heights, N.J.

Continuation-in-part of application Ser. No. 147,145, May 26, 1971, now abandoned. This application July 20, 1971, Ser. No. 164,406
Int. Cl. B24b 17/02
U.S. Cl. 51—101 R 20 Claims



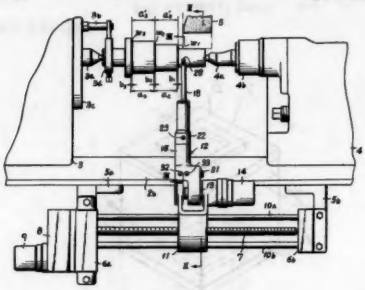
A grinding apparatus having a cam member with a surface corresponding to the surface of the workpiece to be ground, a grinding wheel for grinding the surface of the workpiece, a support for fixing the workpiece for movement with the cam member and drive elements for moving the workpiece

against the grinding wheel and along a path corresponding to the surface of the cam.

3,663,189
AUTOMATIC END SURFACE POSITIONING APPARATUS FOR USE WITH DIGITALLY CONTROLLED MACHINE TOOLS

Tsuyoshi Kolde, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Mar. 19, 1970, Ser. No. 20,970
Claims priority, application Japan, Mar. 25, 1969, 44/22981
Int. Cl. B24b *49/00*
U.S. Cl. 51—165.8 **6 Claims**

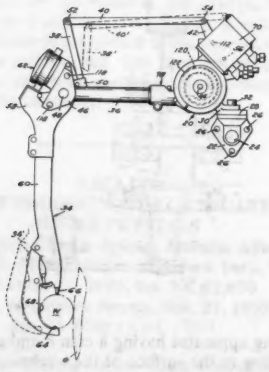


For use with a digitally controlled machine tool wherein a workpiece having a plurality of spaced apart end surfaces to be machined is rotatably supported between a head stock and a tail stock mounted on a table and a tool carriage having a tool thereon is moved toward and away from the workpiece there is provided an automatic end surface positioning apparatus comprising an automatic end surface measuring device mounted upon the bed of the machine tool to be slidable in the same direction as the table, a threaded rod and a pulse motor to slide the automatic end surface measuring device and a control circuit for simultaneously or selectively operating the driving pulse motor for the table and the driving pulse motor for the automatic end surface measuring device in response to the output signal produced thereby.

3,663,190
GAUGE SUPPORT

James C. Fisk, G-3219 East Bristol Rd., Flint, Mich.

Filed Apr. 22, 1970, Ser. No. 30,813
Int. Cl. B24b *49/04*
U.S. Cl. 51—165.74 **13 Claims**

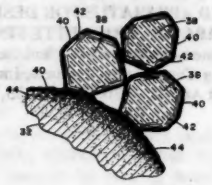


A gauge support or mounting for a gauge which automatically puts the gauge on and removes the gauge from successive workpieces in synchronous relation with the operations of a machine tool on the workpieces. The gauge is held continuously on the workpiece during the grinding or other operation to continuously indicate the progress of such operation. At the conclusion of the machine operation on the workpiece, the machine tool is retracted from the workpiece and the gauge is simultaneously withdrawn from engagement with the workpiece. When a new workpiece is inserted in position on the machine, the tool is shifted into working contact with the workpiece, and the gauge is simultaneously moved into gauging engagement with the workpiece. The movement of the gauge on the support or mounting toward and away from the workpiece is accomplished automatically and in response to the corresponding movements of the machine tool.

3,663,191
DIAMOND TOOL AND METHOD OF MAKING THE SAME

Ernest A. Kroder, Hellam, Pa., assignor to Dentsply International Inc., York, Pa.

Continuation-in-part of application Ser. No. 696,633, Jan. 9, 1968, now abandoned. This application July 23, 1970, Ser. No. 57,802
Int. Cl. C09c *1/68*; B24d *3/02*
U.S. Cl. 51—309 **14 Claims**



A grinding and cutting tool comprised of diamond particles bonded to a support base member by the process of vapor deposition to form a metal lattice matrix chemically bonded to a surface of the diamond particles and metallurgically bonded to the support base member and the diamonds bonded to each other by inosculation, the reactions greatly enhancing the strength of the bonds.

A novel method of vapor deposition, controlled by electrical charges and by said means to impart kinetic energy to the ions of the vapor of sufficient velocity to cause penetration of said ions into the molecular structure of the support base causing a metallurgical reaction and into the molecular structure of the diamond surfaces causing a chemical reaction. In addition, by inducing a secondary electrical field, divergence of said ions can be controlled to cause said ions to be deposited in a predetermined pattern.

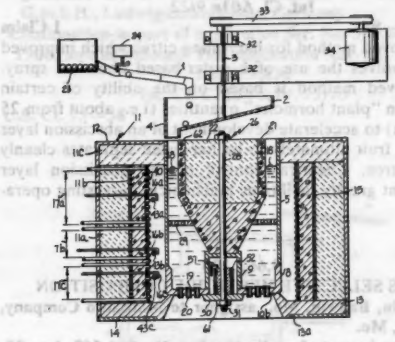
3,663,192
GLASS MELTING POT

Walter Merton Perry, Darien, Conn., assignor to Johns-Manville Corporation, New York, N.Y.

Filed Nov. 28, 1969, Ser. No. 880,713
Int. Cl. C03b *37/02*
U.S. Cl. 65—11 R **12 Claims**

A circular bushing or glass melting pot assembly of the type which has a multiplicity of apertures in the bottom of the pot to permit the drawing of a multiplicity of continuous glass filaments therefrom. The main body of the pot is made of a high melting point base metal such as nickel, a nickel base alloy, a nickel-chromium base alloy, a cobalt-nickel base alloy, stainless steel or the like, and the pot is preferably heated by one or more spiral electric heating coils disposed

around the outside surface of the sidewalls and spaced therefrom. A secondary heating coil may be mounted in the lower central portion of the pot, with a conical metal shell disposed over the secondary heating coil both to enclose the coil and to prevent the accumulation of a stagnant section of somewhat cooler glass in the lower central portion of the pot.



A cylindrical body is preferably positioned in the center of the pot, starting at the top, to confine the melting zone to an outer annular space, and uniform feeding of marbles to this space is provided. For higher production rates, the upper melting zone of the pot is larger in diameter to increase the rate of melting.

3,663,193

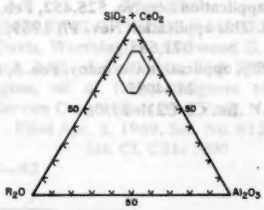
STRENGTHENED PHOTOSENSITIVE OPAL GLASS

Lois E. Wilson, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 30, 1969, Ser. No. 837,943

Int. Cl. C03c *15/00*; C03b *29/00*

U.S. Cl. 65—30 **4 Claims**



This invention relates to a method for making a composite opal glass article exhibiting very high mechanical strength and being composed of an interior portion and an integral surface layer containing crystals having a lower coefficient of thermal expansion than the glass such that the surface layer is under compression, the glass falling within the Li_2O–Al_2O_3–SiO_2–CeO_2 composition area and including at least one photosensitive metal selected from the group consisting of copper, silver, and gold.

3,663,194

METHOD FOR MAKING MONOLITHIC OPTO-ELECTRONIC STRUCTURE

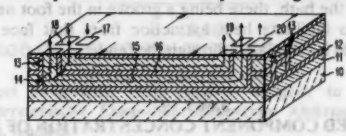
Bernard Greenstein, Toledo, Ohio; Perry R. Langston, Jr., Poughkeepsie, N.Y.; Bernt Narken, Poughkeepsie, N.Y., and Brian Sunners, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 25, 1970, Ser. No. 40,069

Int. Cl. C03c *29/00, 27/00*

U.S. Cl. 65—43 **6 Claims**

Multilayer opto-electronic module structures and their method of fabrication. Alternate layers of light conducting material and light isolating material are formed on a substrate and on each other. Isolating bars are formed in a predetermined pattern within the layers of light conducting



material to define optical channels or chambers. Suitable illuminating and detecting means may be included within the channels using the isolating materials as electrical conductors so as to perform logic, memory and display functions.

3,663,195

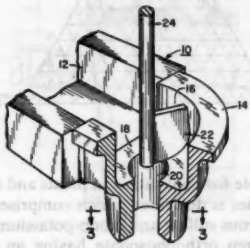
APPARATUS FOR AND METHOD OF ORIENTING CORDS IN A MOLTEN GLASS DOWNDRAW BOWL

George D. Lipp, Corning; Villem Rahe, Painted Post, and Lawrence B. Roberts, Big Flats, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 18, 1970, Ser. No. 37,988

Int. Cl. C03b *5/26*

U.S. Cl. 65—132 **6 Claims**



A directional vane is mounted in a predetermined position within the well or bowl of a molten glass delivery unit to intercept and collect surface cord at such predetermined location within the bowl, and deliver the surface cord in a desired orientation within the molten glass discharged from the delivery orifice. As the molten glass enters the bowl area of the delivery unit, the surface portion thereof which has a tendency to form a surface volatility cord in the delivered glass, flows into contact with opposite sides of the oriented vane and flows downwardly therealong exiting from the discharge orifice at the same angular position as the predetermined setting of the vane.

3,663,196

APPARATUS FOR MANUFACTURE OF FLOAT GLASS

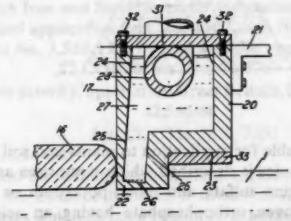
George Alfred Dickinson, and Frank Nixon, both of St. Helens, England, assignors to Pilkington Brothers Limited, Liverpool, England

Filed July 28, 1969, Ser. No. 845,214

Claims priority, application Great Britain, Aug. 12, 1968, 38,393/68

Int. Cl. C03b *18/00*

U.S. Cl. 65—182 R **5 Claims**



For the manufacture of thick glass by the float process, fenders are provided for defining a channel down the molten

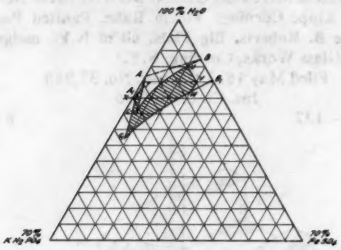
metal bath and each fender comprises a hollow channel member having a flat face which is not wetted by molten glass and which face extends downwardly as a foot for immersion in the bath, there being a groove in the foot near the flat face to facilitate heat extraction from that face when cooling fluid is circulated through the fender.

3,663,197

INCREASED COMPONENT CONCENTRATION OF IRON NUTRIENT SOLUTION

Peter Stanley Backlund, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 12, 1969, Ser. No. 875,739
Int. Cl. C05b 7/00
U.S. Cl. 71—34 6 Claims



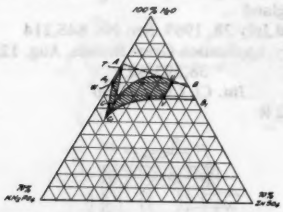
A solution suitable for application to plants and soil to correct iron deficiencies is described which comprises an aqueous solution of ferrous sulfate and mono-potassium or mono-ammonium hydrogen orthophosphate having an acidic pH value from about 1.5 to about 4, and wherein the components of the solution manifest a mutually increased solubility.

3,663,198

INCREASED COMPONENT CONCENTRATION OF ZINC NUTRIENT SOLUTION

Peter Stanley Backlund, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 12, 1969, Ser. No. 875,740
Int. Cl. C05b 7/00
U.S. Cl. 71—34 6 Claims



A solution suitable for application to plants and soil to correct zinc deficiencies is described which comprises an aqueous solution of zinc sulfate and mono-potassium or mono-ammonium hydrogen orthophosphate having an acidic pH value from about 1.5 to about 4, and wherein the components of the solution manifest a mutually increased solubility.

3,663,199

METHOD EMPLOYING A CHEMICAL AID TO IMPROVE THE HARVESTING OF CITRUS

William C. Cooper, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of Agriculture

Filed Oct. 9, 1969, Ser. No. 865,199
Int. Cl. A01n 9/22
U.S. Cl. 71—94 1 Claim

An improved method for harvesting citrus which improved method involves the use of a water-based chemical spray. The improved method is based on the ability of certain chemicals in "plant hormone" quantities (i.e., about from 25 to 100 ppm) to accelerate development of an abscission layer so that the fruit ultimately to be harvested separates cleanly from the tree. Chemical control of the abscission layer development greatly facilitates mechanical harvesting operations.

3,663,200

GRASS SELECTIVE HERBICIDE COMPOSITION

John F. Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 793,567, Jan. 23, 1969, now Patent No. 3,547,620, dated Dec. 15, 1970. This application Sept. 26, 1969, Ser. No. 861,444
Int. Cl. A01n 9/20
U.S. Cl. 71—118 5 Claims

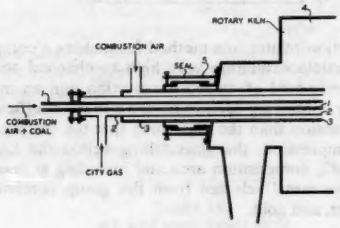
Control of grasses, especially barnyard grass in the presence of rice utilizing a selective herbicidal effective amount of N-butoxymethyl-2',6'-diethyl-2-chloroacetanilide and/or N-butoxyethyl-2',6'-diethyl-2-chloroacetanilide.

3,663,201

PROCESS FOR PRODUCTION OF SPONGE IRON

Gunter Heitmann, Frankfurt am Main-Niederrad, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt, Main, Germany and The Steel Company of Canada Limited, Hamilton, Ontario, Canada

Continuation of application Ser. No. 525,452, Feb. 7, 1966, now abandoned. This application Nov. 17, 1969, Ser. No. 871,681
Claims priority, application Germany, Feb. 5, 1965, M 64055
Int. Cl. C21b 13/08
U.S. Cl. 75—33 2 Claims



Process for production of sponge iron by direct reduction of iron ore wherein iron ore admixed with a carbonaceous reducing agent is passed through a rotary kiln countercurrent to a gas stream, and wherein granular coking high volatile coal is injected co-current to said gas stream as a solid reducing agent by means of oxygen containing gases through an inlet pipe, and said solid reducing agent becomes admixed with the iron ore, and travels countercurrent to said gas stream through the kiln. The process includes the characterizing step of passing gas over the outside of said inlet pipe cocurrent with said injected granular coal and into the kiln. This effects cooling of the inlet pipe, and reduces the tendency of the coal to form a cake on the inlet pipe.

3,663,202

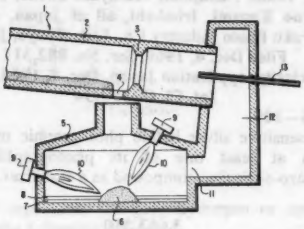
PROCESS FOR MANUFACTURE OF PIG IRON OR STEEL

Hermann Ruter, deceased, late of Ludwigshafen, Rhine, Germany (by Elisbeth Ruter and Edla Ruter, heirs); Egon Cherdon, Limburgerhof/Palatenate; Manfred Haerter, Ludwigshafen/Rhine, and Gerhard Bayer, Ludwigshafen-Rheingonheim, all of Germany, assignors to Gebr, Giulini G.m.b.H., Ludwigshafen/Rhine, Germany

Continuation-in-part of application Ser. No. 599,409, Dec. 6, 1966, now abandoned. This application Nov. 25, 1969, Ser. No. 879,830

Int. Cl. C21b *13/14, 13/10*

U.S. Cl. 75—38 10 Claims



A two-stage method for the reduction of iron-oxide-containing raw materials wherein the iron oxide is reduced by means of solid carbonaceous material in a first stage carried out in a rotary kiln. The raw materials issue from the kiln in the form of a partially reduced sinter containing at least 5 percent free carbon. Reduction is completed in a second state carried out in a direct-fired smelting furnace, where a part of the free carbon in the sinter is burned by hot, oxygen-containing exhaust gases of the direct-fired smelting furnace to effect a temperature rise to smelt the sinter from the first stage.

3,663,203

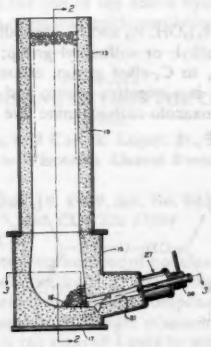
MELTING OF FUSIBLE MATERIALS

James A. Davis, Worthington; Sherwood G. Talbert; Herbert R. Hazard, both of Columbus, and William A. Gibeaut, Worthington, all of Ohio, assignors to Columbia Gas System Service Corporation, New York, N.Y.

Filed Apr. 1, 1969, Ser. No. 812,062

Int. Cl. C21c *5/00*

U.S. Cl. 75—43 12 Claims



The melting of fusible materials wherein the materials are fed into the top of a shaft-type furnace and melted by a jet of gaseous combustion products introduced at the bottom of the furnace. The charge feeds countercurrent to the flow of the combustion products and the melted fusible materials are continuously removed before a pool of molten material forms within the furnace shaft.

3,663,204

METHOD OF MEASURING THE THICKNESS OF A SLAG LAYER ON METAL BATHS

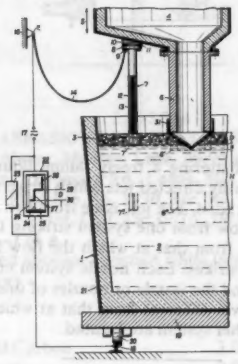
Adalbert Jungwirth, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Apr. 6, 1970, Ser. No. 25,992

Claims priority, application Austria, Apr. 15, 1969, A 3609/69

Int. Cl. C21c *7/10;* G01f *23/26;* G01r *27/26*

U.S. Cl. 75—49 1 Claim



The invention relates to a method for measuring the thickness of a slag layer on metal baths in which a probe connected to an electrical circuit and whose front surface is electrically conductive is lowered with constant speed through the slag layer into the metal bath, the electrical conductivities of the slag and the bath, or their electrical resistances respectively, being recorded in dependence on the speed with which the probe is lowered. Thus, when e.g. melts are to be degassed by vacuum treatment by means of a degassing vessel immersing with a tube into the slag-covered bath and which is periodically lifted and lowered, it is no longer necessary to maintain a great safety distance between the upper dead point and the metal surface. It is advantageous to provide for the upper dead point close to the metal surface because thus the lift height is increased which in turn affords a more rapid throughput of the metal.

3,663,205

METHOD OF REFINING FERROUS METALS

David Arthur Whetton, Worksop, England, assignor to The British Iron and Steel Research Association

Original application Sept. 20, 1967, Ser. No. 669,022, now Patent No. 3,558,120. Divided and this application Sept. 8, 1970, Ser. No. 70,078

Claims priority, application Great Britain, Sept. 23, 1966, 42,550/66

Int. Cl. C21c *5/00, 7/00*

U.S. Cl. 75—60 7 Claims

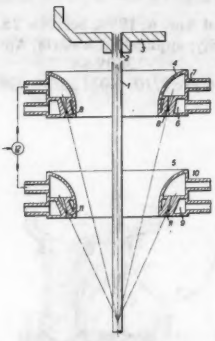
Method for refining molten metal includes the steps of adjusting the distance between a stream of molten metal and the nozzles which direct a stream of oxidizing gas against said stream to shatter it.

3,663,206

TREATMENT OF MOLTEN MATERIAL

Hope Lubanska, London, England, assignor to The British Iron and Steel Association

Filed Nov. 24, 1969, Ser. No. 879,405
Claims priority, application Great Britain, Nov. 27, 1968, 56,250/68
Int. Cl. C21c 5/00, 7/00; B22d 23/08
U.S. Cl. 75—60 28 Claims



A method of shattering a freely falling liquid stream by means of downwardly directed jets which strike the stream at a common impact zone. The jets issue from two or more nozzle systems, the flow from one system striking the stream at an angle different from that at which the flow from at least one other system strikes. Each nozzle system comprises one or more nozzles and the nozzle or nozzles of one system may be located at a level different from that at which the nozzle or nozzles or another system are located.

3,663,207

DIRECT PROCESS FOR SMELTING OF LEAD SULPHIDE CONCENTRATES TO LEAD

Nickolas J. Themelis, Beaconsfield, Quebec, and John R. Rawling, Lively, Ontairo, both of Canada, assignors to Noranda Mines Limited

Filed Apr. 21, 1970, Ser. No. 30,557
Claims priority, application Canada, Oct. 27, 1969, 065897
Int. Cl. C22b 13/02
U.S. Cl. 75—77 10 Claims

A process for continuously smelting and converting lead sulphide concentrates to molten lead or bullion in a furnace comprises introducing pelletized lead sulphide concentrate onto the surface of a molten bath in the furnace and smelting the same therein, introducing oxidizing gas into the furnace to convert the lead sulphide concentrates to molten lead, tapping off molten metallic lead, treating the slag in a slag fuming zone to reduce zinc oxide in the slag to zinc vapor, introducing an oxidizing gas above the slag in the slag fuming zone to oxidize the zinc vapor to zinc oxide fume, passing the fume to a fume collecting area and thereafter withdrawing substantially zinc free slag.

3,663,208

CHROMIUM-NICKEL ALLOY STEEL CONTAINING COPPER

Henry William Kirby, and Arthur Hogg, both of Sheffield, England, assignors to Firth Brown Limited, Sheffield, England

Filed June 19, 1969, Ser. No. 834,878
Claims priority, application Great Britain, June 20, 1968, 29,473/68
Int. Cl. C22c 39/54, 39/20
U.S. Cl. 75—125 12 Claims

An alloy steel for high temperature applications, such as for compressor and turbine discs in gas turbines consists essentially of: 0.02–0.25 percent carbon, 0.05–1.5 percent silicon, 0.1–1.5 percent manganese, 7.0–12.0 percent chromium, 0.2–4.0 percent nickel, 0.2–5.0 percent molybdenum, 0.10–0.60 percent vanadium, 0.05–0.70 percent niobium, up to 7.0 percent cobalt, up to 5.0 percent copper, 0.002–0.03 percent boron, at least 0.010 percent but less than 0.050 percent nitrogen, the balance, apart from incidental impurities being iron.

3,663,209

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING AS A STABILIZER A HYDROIMIDAZO-S-TRIAZINE

Shui Sato; Tomio Nakajima; Masayuki Shono, all of Tokyo, and Teruo Kagami, Irimi-shi, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1969, Ser. No. 882,311
Claims priority, application Japan, Dec. 4, 1968, 43/88338
Int. Cl. G03c 1/34
U.S. Cl. 96—109 3 Claims

A light-sensitive silver halide photographic material containing in at least one of its photographic layers a hydroimidazo-s-triazine compound as a stabilizer.

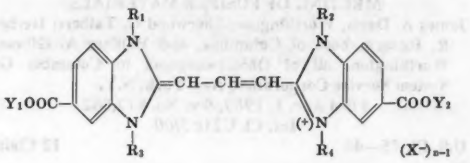
3,663,210

LIGHT-SENSITIVE SILVER HALIDE SUPERSENSITIZED PHOTOGRAPHIC MATERIAL

Shui Sato, Tokyo; Eiichi Sakamoto, Hanno; Shizuo Saito, Tokyo; Kaiichiro Sakazume, Tokyo, and Tokuzo Kaneko, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

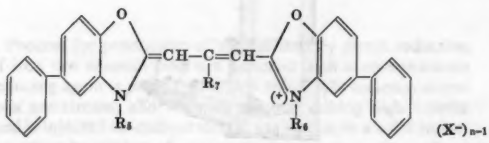
Filed Apr. 15, 1970, Ser. No. 28,711
Claims priority, application Japan, Apr. 19, 1969, 44/30086
Int. Cl. G03c 1/14
U.S. Cl. 96—124 3 Claims

A light-sensitive silver halide photographic material which contains at least one layer of silver halide emulsion including a combination of at least one benzimidazolo-carbocyanine dye represented by the general formula



(I)

—$(CH_2)_2O(CH_2)_2OH$; R_3 and R_4 are individually a C_1 to C_4-alkyl, hydroxyalkyl, or sulfoalkyl group; Y_1 and Y_2 are individually a C_1 to C_4-alkyl group, ethoxyethyl group or an aryl group; X^- is a negative group; and n is 1 or 2; and at least one benzoxazolo-carbocyanine dye represented by the general formula



(II)

wherein R_5 and R_6 are individually a C_1 to C_4-alkyl or sulfoalkyl group; R_7 is a C_1 to C_4-alkyl group; X^- is a negative group; and n is 1 or 2.

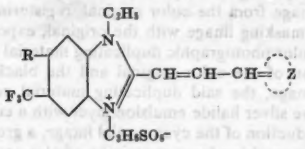
3,663,211

SILVER HALIDE EMULSIONS CONTAINING UNSYMMETRICAL TRIMETHINE SENSITIZING DYES

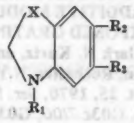
Shi-Kuang Yao, Binghampton, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed July 2, 1969, Ser. No. 838,709
Int. Cl. G03c 1/10
U.S. Cl. 96—138 14 Claims

The instant invention is directed to carbocyanines having the following formula:



wherein R represents halogen, hydrogen or cyano and Z represents the following radicals



in which X is selected from the group consisting of oxygen and sulphur atoms, R_1 and R_4 represent lower alkyl radicals or benzyl, and R_2 and R_3 represent lower alkyl radicals, halogen radicals, or hydrogen. In addition the instant invention is directed to the use of the above dyestuffs for second order sensitization of photographic emulsions.

3,663,212

NODULAR IRONS AND METHOD FOR CONTROLLING SAME

Richard W. Heine, and Carl R. Loper, Jr., both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed July 18, 1969, Ser. No. 843,186
Int. Cl. C22c 37/04
U.S. Cl. 75—123 CB 7 Claims

Method for controlling number of nodules per unit volume in malleable and ductile irons by the incorporation of both titanium and tellurium as essential components in the range of 0.003 to 0.05 percent by weight titanium with the tellurium being present in the ratio of 1 part by weight tellurium to 10 to 50 parts by weight titanium. Titanium may be replaced in whole or in part with equivalent amounts of niobium, vanadium, or aluminum. Tellurium may be replaced in whole or in part with equivalent amounts of antimony or rare earth metals.

3,663,213

NICKEL-CHROMIUM-IRON ALLOY

Herbert Louis Eiselstein, and Edward Frederick Clatworthy, both of Huntington, W. Va., assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 10,004, Feb. 9, 1970, which is a continuation-in-part of application Ser. No. 766,611, Oct. 10, 1968. This application May 11, 1970, Ser. No. 36,420
Int. Cl. C22c 39/20
U.S. Cl. 75—124 7 Claims

A strongly age-hardenable alloy having low annealed base hardness, high strength in the aged condition, excellent weldability and unexpectedly good machinability contains about 35 percent to about 46 percent nickel, about 12 percent to about 20 percent chromium, about 1.25 percent to about 2.5 percent titanium, about 2.25 percent to about 3.5 percent columbium, up to about 0.08 percent carbon, about 0.0005 percent to about 0.006 percent boron, about 0.05 percent to about 1 percent aluminum and the balance essentially iron.

3,663,214

ABRASION RESISTANT CAST IRON

William H. Moore, Meadow Lane, Purchase, N.Y., and Harry H. Kessler, 7 Dromara Rd., Ladue, Mo.

Filed Feb. 16, 1970, Ser. No. 11,491
Int. Cl. C22c 39/16, 39/32
U.S. Cl. 75—126 A 2 Claims

A wear and abrasion resistant white iron having a composition as follows:

Total Carbon	3.0% to 4.0%
Silicon	0.0% to 2.5%
Manganese	7.0% to 15.0%
Chromium	8.0% to 15.0%
Other alloying constituents	0.0% to 5.0%

and having a microstructure of predominantly chunky or needle carbides in a matrix predominantly austenitic.

3,663,215

WEAR-RESISTANT STAINLESS STEEL

Harry Tanczyn, Baltimore, Md., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Aug. 13, 1969, Ser. No. 849,861
Int. Cl. C22c 13/20
U.S. Cl. 75—128 C 9 Claims

Austenitic stainless steel characterized by workability, weldability and resistance to wear. The steel contains the three essential ingredients chromium, nickel and silicon, with one or more of molybdenum, tungsten, vanadium, columbium/tantalum and titanium, and remainder iron. The chromium amounts to about 10 percent to 22 percent, nickel about 14 percent to 25 percent, silicon about 5 percent to 12 percent especially about 7 percent to 11 percent, together with about 3 percent to 12 percent of the group consisting of molybdenum up to 10 percent, tungsten up to 8 percent, vanadium up to 5 percent, columbium/tantalum up to 5 percent and titanium up to 5 percent. The carbon content should not exceed about 0.15 percent. Copper may be present in amounts up to 5 percent. The steel is particularly suited to applications in the food-processing, the petrochemical and the nuclear industries, where sliding or relatively moving parts are encountered. It also is suited to the production of cutting tools and surgical instruments.

3,663,216

ALUMINUM ELECTRICAL CONDUCTOR

Harold Y. Hunsicker, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 889,314, Dec. 30, 1969, now abandoned. This application Aug. 10, 1970, Ser. No. 62,633

Int. Cl. C22c *21/00*; C22f *1/04*

U.S. Cl. 75—142 7 Claims

Aluminum conductor containing 0.25 to 0.5% Cu and 0.05 to 0.20% Mg and having good tensile strength and a minimum electrical conductivity of 60 percent IACS together with good bendability and improved connector conduction stability. A preferred fabrication method contemplates working at temperatures that retain the Cu and Mg is solid solution but also impart strain hardening, a drastic cold reduction to produce a severely strain hardened conductor product followed by a controlled thermal treatment to relax a certain amount of the strain and precipitate a portion of the Cu and Mg.

3,663,217

BRAZING ALLOY FOR ELEVATED TEMPERATURE SERVICE

John Henry Olson, Franklin Lakes, and Raymond Francis Vines, Chatham, both of N.J., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Aug. 7, 1970, Ser. No. 62,133

Int. Cl. C22c *5/00*

U.S. Cl. 75—165 4 Claims

Brazing alloy of composition containing gold, nickel, palladium, silver and copper has satisfactory flow characteristics for brazing at a temperature not exceeding 1,900° F. and provides brazed bonds having good strength and oxidation resistance at elevated temperatures such as 1,000° F. or higher.

3,663,218

BURNABLE POISON FOR NUCLEAR REACTOR

William R. Yario, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 12, 1969, Ser. No. 868,955

Int. Cl. C22c *15/00*

U.S. Cl. 75—177 1 Claim

An alloy for use as a burnable poison in nuclear reactors which consists of 0.5 – 14 weight percent gadolinium and 0 – 4 weight percent tin with the remainder being zirconium.

ERRATUM

For Class 92—57 see:
Patent No. 3,663,226

3,663,219

ELECTROPHOTOGRAPHIC PROCESS

Toru Takahashi, Tokyo, Japan, assignor to Canon Camera Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1968, Ser. No. 729,567

Claims priority, application Japan, June 29, 1967, 42/56049; May 23, 1967, 42/32962

U.S. Cl. 96—1.4 2 Claims

In an electrophotographic process in which the electrostatic latent image on a photosensitive plate is developed by a liquid developer and the resulting toner image is transferred to a copying material, an electric field is applied to the liquid developer squeezing means in order to prevent the disturbance of the toner image caused by the flow of toner particles in a carrier pool formed at the squeezing site. The electric field is applied in such a direction that toner particles are attracted to the photosensitive plate before transferring the toner particles to the copying material and/or toner particles are attracted to the copying material after transferring the toner particles to the copy material.

3,663,220

MATERIAL AND A PROCESS FOR THE PRODUCTION OF COLOR CORRECTED REPRODUCTIONS

Ehrhard Hellmig, and Erich Reckziegel, both of Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 16, 1970, Ser. No. 29,283

Claims priority, application Germany, Apr. 29, 1969, P 19 21 739.1

Int. Cl. G03c *7/18*, *5/50*

U.S. Cl. 96—6 6 Claims

A process for the production of color duplicates from a multicolored original by a photographic color reversal process comprising the steps of producing a black and white masking image from the color original, registering the black and white masking image with the original, exposing a multilayered color photographic duplicating material through the combination of the color original and the black and white masking image, the said duplicating material comprising a red sensitive silver halide emulsion layer with a color coupler for the production of the cyan partial image, a green sensitive silver halide emulsion layer containing a color coupler for the production of the magenta partial image and a blue sensitive silver halide emulsion layer with a color coupler for the production of the yellow partial image and color reversal processing the exposed material to produce a color duplicate in true colors.

3,663,221

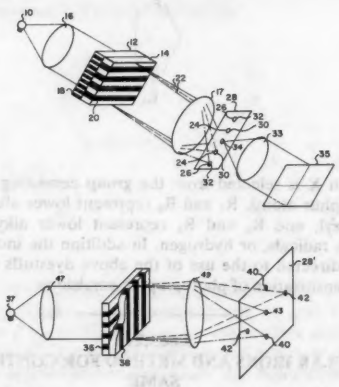
COLOR RECORDING ON PANCHROMATIC SENSITIZED MATERIAL BY ADDITIVE MODULATION OF PRE-EXPOSED GRATINGS

George C. Higgins; Clark N. Kurtz, and Fred C. Eisen, all of Kodak Park Division, Rochester, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,459

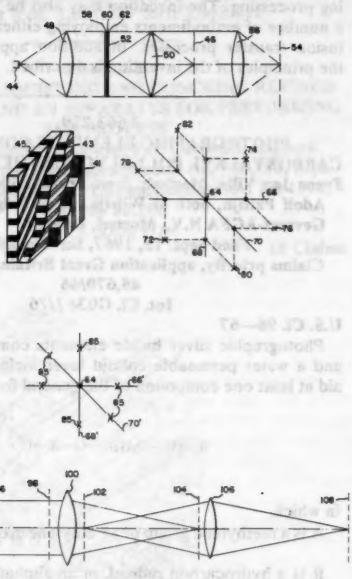
Int. Cl. G03c *7/00*; G03b *33/00*

U.S. Cl. 96—22 15 Claims



Three color components of a scene are recorded on a black-and-white film which has, for example, separate blue, green and red sensitive elements and which has been pre-exposed with blue light, with green light and with red light to a grating or grid pattern. The gratings may be recorded angularly disposed relative to one another, or if of different spatial frequencies, they may be mutually aligned for every pre-exposure. When the pre-exposed film is subsequently exposed in a camera to a visual scene, the additional component scene exposures representative of color components of the visual scenes modulate corresponding grating latent images in accordance with the color and luminance of the component scene elements. After proper processing of the film, a

color image can be formed by placing the film in a spatial filtering projection system using color filters. The color image



can then be recorded on conventional color print materials or displayed.

3,663,222

PROCESS FOR PREPARING STERIC BLOCK WITH LIQUID PHOTOPOLYMERIZABLE COMPOSITION

Kiyoshi Akamatsu, and Hisaaki Fukui, both of Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 6, 1968, Ser. No. 748,125
Int. Cl. G03c *5/00*
U.S. Cl. 96—35.1 **5 Claims**

A process for preparing a photopolymerized steric image-bearing block for printing, display, ceramic ware matrix, etc, which comprises disposing an image-bearing transparency or semi-transparency or one side of a photopolymerizable composition, irradiating an actinic light to both sides thereof and removing the unexposed area to give a steric image-bearing block in which a relief portion and a substrate layer are integrally formed. There can also be obtained a steric image-bearing block having a substrate layer having partly different thickness.

3,663,223

PROCESS FOR MAKING INTEGRATED CIRCUIT MASKS

Hans R. Camenzind, Santa Clara, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed May 13, 1969, Ser. No. 824,197
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.2 **1 Claim**

Process for making a mask for integrated circuits in which a drawing is prepared of each standard pattern required in the circuit. A plurality of positive copies are prepared of each drawing with the number of positive copies being equal to the number of times the standard pattern is repeated in the integrated circuit. The positive copies are arranged on a sheet of substantially transparent dimensionally stable material and then secured in the desired positions. The non-standard parts are then drawn onto the sheet for interconnecting the standard patterns to provide a composite pattern for the integrated circuit. The composite pattern is then utilized for producing a negative of the pattern for the integrated circuit. The assembly consists of the substantially transparent, dimensionally stable sheet which has fastened thereto positive copies of the standard patterns with interconnecting circuitry drawn on the sheet.

3,663,224

ELECTRICAL COMPONENTS, ELECTRICAL CIRCUITS, AND THE LIKE, AND METHODS FOR MAKING THE SAME BY MEANS OF RADIATION SENSITIVE ELEMENTS

Robert W. Hallman, Utica, and Gary W. Kurtz, Southfield, both of Mich., assignors to Teeg Research, Inc., Detroit, Mich.

Continuation-in-part of application Ser. No. 646,109, June 6, 1967, now abandoned, which is a continuation-in-part of application Ser. No. 591,711, Nov. 3, 1966, now abandoned. This application Nov. 21, 1969, Ser. No. 878,846
Int. Cl. G03c *5/00, 11/00*
U.S. Cl. 96—38.4 **12 Claims**

Electrical components, such as resistors, capacitors, and the like, and electrical circuits and methods for making the same by means of radiation sensitive elements comprising essentially a metallic layer in proximity with and adhering to a layer of an inorganic material capable, when exposed to electromagnetic actinic radiation, to interreact with the metal or metals of the metallic layer. The electrical components and electrical circuits are, according to the method of the invention, "printed" upon the radiation sensitive element by projecting thereon appropriate patterns, and the electrical characteristics of the components and circuits are determined by the geometrical dimensions of the patterns projected upon the radiation sensitive elements and by the amount of irradiation of the elements.

3,663,225

PHOTOGRAPHIC REFLEX PROCESS

Gerald L. McLeod, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Apr. 4, 1969, Ser. No. 813,767
Int. Cl. G03g *1/00, 7/00;* **G03c** *5/74*
U.S. Cl. 96—48 **9 Claims**

This disclosure relates to a method of making a reflex copy of a master by reflex exposing a photosensitive medium comprising a photoconductor sensitized to the reflex light but substantially not sensitive to the light which passes through the said medium from the external light source employed. The photoconductor is rendered chemically reducing when exposed to activating radiation, and is sensitized to the reflex light by uniformly exposing the photoconductor to bandgap light and allowing the activation to decay. Development of the medium after reflex exposure gives a negative image. To obtain a positive image, the developed reflex-exposed medium is used as a master and again reflex exposed using the same process to obtain a positive image.

3,663,226

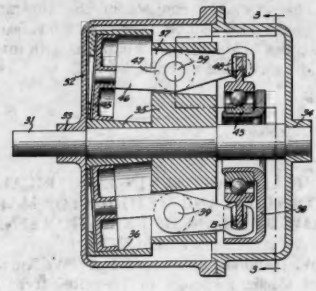
VARIABLE PISTON-STROKE MECHANISMS

Arnold E. Biermann, Redart, Va.

Filed Apr. 22, 1969, Ser. No. 818,212
Int. Cl. F01b *13/04*
U.S. Cl. 92—57 **6 Claims**

This specification covers variable piston-stroke, revolving cylinder mechanisms in which means are provided for return-

ing the pistons to minimum cylinder-head-clearance position for any piston stroke length and in which counter-balance



means are provided for minimizing piston side thrust as caused by centrifugal forces.

3,663,227

RAPID STABILIZATION PROCESS FOR PHOTOGRAPHIC SILVER HALIDE MATERIALS

Kinji Ohkubo, and Katsumi Hayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Kanagawa, Japan

Filed Nov. 28, 1969, Ser. No. 880,975
Claims priority, application Japan, Nov. 29, 1968, 43/87417
Int. Cl. G03c *5/38, 5/26, 1/06*
U.S. Cl. 96—61 **12 Claims**

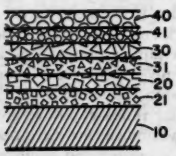
An improved stabilization process for photographic silver halide light-sensitive material comprising adding to a rinsing solution, used in the process, an antioxidant selected from the group recited in claim 1.

3,663,228

COLOR PHOTOGRAPHIC FILM HAVING EXTENDED EXPOSURE-RESPONSE CHARACTERISTICS

Charles W. Wyckoff, Needham, Mass., assignor to Applied Photo Sciences, Inc., Newbury, Mass.

Continuation-in-part of application Ser. No. 445,496, Apr. 5, 1965, now abandoned , which is a continuation-in-part of application Ser. No. 98,176, Mar. 24, 1961, now Patent No. 3,450,536, dated June 17, 1969. This application Nov. 14, 1969, Ser. No. 876,626
Int. Cl. G03c *1/76, 1/84, 3/00*
U.S. Cl. 96—74 **11 Claims**



A color photographic film with extended exposure response characteristics having a plurality of emulsion layers divided into sets, each set having a different photographic speed. The emulsion layers within a set have the same photographic speed but each layer is responsive to a different region of the spectrum. The emulsion layers are arranged either one above the other or side-by-side in a geometric pattern and all have D-log characteristic curves which have substantially equal slopes. The effective speed of one set is adjusted such that it commences responding to impinging light as another set approaches saturation. This is accomplished either by selection of the basic sensitivities of the various emulsions or by the use of auxiliary means such as attenuating filters. Dye-forming couplers may be incorporated during manufacture in all emulsion layers or may be introduced during processing. The invention may also be incorporated into a number of embodiments employing either the diazo or diffusion transfer processes. In addition apparatus employing the principles of the invention is described.

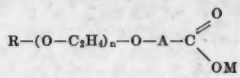
3,663,229

PHOTOGRAPHIC ELEMENTS CONTAINING CARBOXYALKYL POLYGLYCOL ETHERS AND ESTERS

Frans Jan Ville, Mortsel; Jozef Frans Willems, and Hendrir Adolf Pattijn, both of Wilrijk, all of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed Sept. 15, 1967, Ser. No. 668,189
Claims priority, application Great Britain, Oct. 12, 1966, 45,670/66
Int. Cl. G03c *1/76*
U.S. Cl. 96—67 **12 Claims**

Photographic silver halide elements comprising a support and a water permeable colloid layer including as a coating aid at least one compound of the general formula:



in which

A is a methylene group or an ethylene group,

R is a hydrocarbon radical, or an aliphatic carboxylic acyl radical,

n is an integer up to 40, and

M is hydrogen, an alkali metal atom, ammonium or an organic amine, are described. These photographic elements do not exhibit hydrophobic inclusions which lead to repellency spots or comets.

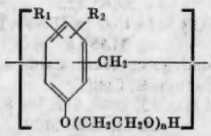
3,663,230

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Shui Sato; Masao Ishihara, both of Tokyo; Eiichi Sakamoto, Hanno-shi; Masayuki Shono, and Osakazu Sugino, both of Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed June 11, 1969, Ser. No. 832,478
Claims priority, application Japan, June 12, 1968, 43/39937
Int. Cl. G03c *1/28, 1/34, 1/04*
U.S. Cl. 96—107 **5 Claims**

An ethylene oxide addition polymer of an alkylphenol- formaldehyde condensate, said polymer consisting of the recurrent structural unit of the formula



wherein R_1 is an alkyl group; R_2 is an alkyl group or a hydrogen atom; and *n* is an integer of 1 to 100, and having an average polymerization degree in the range of 2 to 10, has been found effective as a sensitizer for a light-sensitive silver halide photographic emulsion, without causing any adverse effect on photographic properties.

ERRATA

For Classes 96—109 thru 96—138 see: Patent Nos. 3,663,209 thru 3,663,211

3,663,231

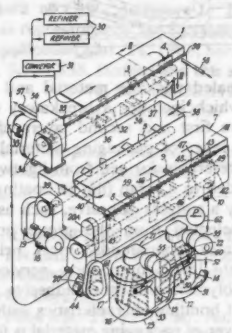
PROCESS OF LIQUIFYING AND CONCHING REFINED CHOCOLATE AND AN APPARATUS FOR PERFORMING THE PROCESS

Alfred George Tourell, Penarwyn, Par, Cornwall, England

Continuation-in-part of application Ser. No. 758,798, Sept. 10, 1968, now abandoned. This application Nov. 17, 1970, Ser. No. 90,298

Int. Cl. A23g *1/14*

U.S. Cl. 99—236 CC **18 Claims**



Chocolate continuously fed from refiners is continuously liquified and conched in an apparatus consisting of a compression stage, a shredding stage, a vibration stage, a blending stage and a final conching stage arranged one after another. Each of the compression, shredding and vibration stages includes a rotary shaft extending in and along a trough and carrying blades appropriate to the function being performed. Each of the blending and final conching stages includes an upright cylindrical vessel containing a rotary gate-type blade rotatable about the axis of the vessel.

3,663,232

MACARONI PRODUCT CONTAINING NONFAT MILK SOLIDS

Elmer F. Glabe, Chicago, Ill., assignor to Milk Research, Inc., Fond du Lac, Wis.

Continuation-in-part of application Ser. No. 432,815, Feb. 15, 1965, now abandoned. This application Jan. 2, 1968, Ser. No. 694,795

Int. Cl. A23l *1/16*

U.S. Cl. 99—85 **1 Claim**

A macaroni product containing less than 0.5 percent by weight fat and 5 percent to 30 percent by weight nonfat milk solids is prepared. In the process nonfat dry milk is used and the preliminary partial drying is effected at a relative humidity of 55 percent to 70 percent and a temperature of 95° F. to 105° F.

3,663,233

METHOD OF TENDERIZING, CURING AND COOKING A MEAT PRODUCT

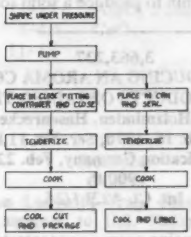
Julius L. Keszler, Boston Post Road, Westbrook, Conn.

Continuation-in-part of application Ser. No. 725,326, Apr. 30, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 640,594, May 23, 1967, now abandoned. This application Sept. 28, 1970, Ser. No. 76,172

Int. Cl. A22c *18/00;* A23b *1/00*

U.S. Cl. 99—107 **4 Claims**

This invention relates to a process of tenderizing and cooking meat products. A piece of meat is formed to impart thereto a permanent set. The shaped meat has injected or inserted therein a liquid agent and is placed in a close fitting container which is then closed. The container and the meat therein is preheated at a low temperature less than that



required for cooking to allow the agent to permeate all through the meat and produce accelerated tenderizing thereof. Subsequently the meat is fully cooked at a higher temperature with minimum weight loss.

3,663,234

METHOD FOR PROCESSING A COMPOSITE FOOD OF FISH MEAT-BEAN CURDS AS AN INSTANT FOODSTUFF

Hitoshi Ichihata, Kannamimachi, Tagata-gun, Shizuoka-Prefecture, Japan, assignor to Morinaga Confectionery Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1968, Ser. No. 700,011

Claims priority, application Japan, Jan. 27, 1967, 42/5306

Int. Cl. A23l *1/325*

U.S. Cl. 99—111 **5 Claims**

Method for processing a composite food of fish meat-soy curds as an instant foodstuff, wherein a homogeneous mixture of refined fish meat with 5.0 per cent or more of soy curds is molded, or a homogeneous coagulated substance that is resulted from adding a coagulating agent to the mixture of the said refined fish meat with 2.5 per cent or more of bean soup or the like, is molded, and then is subjected to conventional processing steps e.g. steam heating, refrigeration, recovery from refrigeration and drying, and then the molded substance is given a spongy structure and if necessary is fried with edible oil.

3,663,235

PROCESS OF PREPARING MARGARINE CONTAINING DIACYGLYCEROPHATIDE

Hans-Udo Menz, Schenefeld/Hamburg; Horst Otto Adolf Trapp, Oftersheim/Ueber, and Theophil Wieske, Hamburg, all of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 13, 1970, Ser. No. 28,035

Int. Cl. A23d *3/00*

U.S. Cl. 99—123 **3 Claims**

Aqueous fat emulsions of improved stability, especially emulsions with milk protein, contain as emulsifying agent a diacylglycerophosphatide of the structure $RCOOCH_2{\cdot}CHOCOCR^1CH_2OPO_3H{\cdot}CH_2CH_2R^2$ where RCO and R^1CO are fatty acid acyl groups together containing from eight to 32 carbon atoms, one of them having at least six and the other from two to 12 carbon atoms, and R^2 is a methylamino, dimethylamino, or trimethylammonium group, or an acylamino group whose fatty acid acyl residue has from two to 12 carbon atoms. Margarine is made by phase-inversion of such oil-in-water emulsions of high fat content.

3,663,236

BUTTER FLAVORED COMPOSITION

Milton J. Holloway, Portola Valley, Calif., assignor to Beatrice foods Co., Chicago, Ill.

Filed Feb. 13, 1970, Ser. No. 11,340
Int. Cl. A23g *3/00*; A23l *1/26*
U.S. Cl. 99—134 **10 Claims**

A low butterfat, butter flavored composition of sugar, condensed buttermilk, and a vegetable oil cooked together at 300° F for at least 5 min to produce a solid solution.

3,663,237

METHOD OF PRODUCING AN AROMA CONCENTRATE AND THE PRODUCTS OBTAINED THEREBY

Hans G. Moller, 345 Holzminden, Hasenrecke 10, Germany

Filed Feb. 16, 1970, Ser. No. 11,881
Claims priority, application Germany, Feb. 22, 1969, P 19 08 900.0
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 R **23 Claims**

A method of producing aroma concentrates by smoking a meaty substance and then extracting with an organic solvent for the smoke flavor produced.

3,663,238

VANILLA BEAN DRYING AND CURING

Albert J. Karas; Richard L. Hall, and William H. Stahl, all of Baltimore, Md., assignors to McCormick & Company, Incorporated, Baltimore, Md.

Filed Mar. 27, 1968, Ser. No. 716,499
Int. Cl. A23l *1/22*
U.S. Cl. 99—140 R **6 Claims**

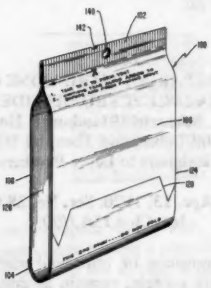
Green vanilla beans are chopped into approximately one-half inch lengths, cured for about 70–78 hours in perforated trays within a closed tank maintained at about 140° F., exudate being returned to the beans; dried in a rotary forced air, hot water jacketed drier at about 140° F. until reduced to about 35–40 percent moisture by weight, transferred to a conditioner and dried more slowly with air at room temperature and humidity until reduced to about 20–25 percent moisture content by weight.

3,663,239

TOASTER PACKAGES HAVING FOUR SPOUTS

James H. Rowe, and Joseph Markus, both of Long Island, N.Y., assignors to Nabisco, Inc.

Filed Apr. 7, 1969, Ser. No. 813,911
Int. Cl. B65d *85/36*, *65/42*, *5/74*
U.S. Cl. 99—171 **19 Claims**



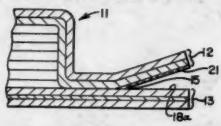
Packages having pour spouts for storing food and heating the food in a toaster including a top seal having the pour spout incorporated therein in order to permit formation of the pour spout after the packages are vented by tearing through the top seal to enable food to be poured from the packages. A method of forming the packages including folding a sheet of material upon itself to form a top margin, a bottom margin and a longitudinal seam, sealing the longitudinal seam, forming a bottom seal with the bottom margin, filling the package through the top margin with food, and forming a top seal with the pour spout by folding the top margin upon itself twice.

3,663,240

PACKAGE AND METHOD OF MAKING SAME

Oscar E. Seiferth; Paul E. Grindrod; Maurice J. Gifford, and Glenn M. Austin, all of Madison, Wis., assignors to Oscar Mayer & Co., Inc.

Filed Mar. 24, 1969, Ser. No. 809,497
Int. Cl. B65d *75/36*; B32b *31/20*
U.S. Cl. 99—174 **13 Claims**



A hermetically sealed package material and method of making the same which includes a breakaway or peelable seal formed between first and second layers of packaging materials. The first layer of packaging material includes a backing member, preferably formed from lightweight paper stock, which is bonded to a saran film or coating while in a supercooled state by a suitable adhesive, such as, for example, an adhesive selected from the group consisting of styrene-butadiene latex compounds, vinyl printing inks, ethylene-vinyl acetate latex compounds, acrylonitrile-vinylidene chloride copolymers and other adhesive compounds exhibiting equivalent bonding characteristics with saran type films. The second layer of packaging material is formed from an ethylene-polar monomer copolymer film or coating material, such as, for example, an ethylene-vinyl acetate film, which is bonded to a suitable oxygen barrier material such as, for example, an oxygen barrier saran film. The peelable or breakaway seal is formed between the saran film or coating of the first layer of packaging material and the ethylene-polar monomer copolymer film or coating of the second layer of packaging film.

3,663,241

METALLIZING COMPOSITION CONTAINING NICKEL POWDER

Oliver Alton Short, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 20, 1970, Ser. No. 39,152
Int. Cl. C09d *5/24*
U.S. Cl. 106—1 **5 Claims**

A mounting pad for aluminum terminated integrated circuit chips comprising a novel fired metallizing composition which comprises nickel powder coated with a nickel coating wherein said coating contains about from 0.1 to 14 percent by weight phosphorous as nickel phosphide.

3,663,242

STABILIZED ELECTROLESS PLATING SOLUTIONS

Michael Gulla, Newton, and Oleh B. Dutkewych, Medfield, both of Mass., assignors to Shipley Company, Inc., Newton, Mass.

Continuation-in-part of application Ser. No. 785,350, Dec. 19, 1968, now abandoned. This application Sept. 25, 1970, Ser. No. 75,737
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 **11 Claims**

An electroless copper plating solution is characterized by the addition of a small but effective amount of a source of mercury ions for increased bath stability. It is known in the art that solutions for electroless copper plating are unstable and tend to decompose with use. It is also know that decomposition can be retarded and the useful life of a copper solution increased by the addition of various additives, frequently

catalytic poisons, in very small concentrations. In accordance with the present invention, it has been found that the stability of an electroless plating solution can be substantially increased by the addition of a source of mercury ions alone as a primary stabilizer, or preferably, by the addition of the mercury ions as a secondary stabilizer in combination with a prior art stabilizer as primary stabilizer. The combination of stabilizers provides a synergism with stability substantially improved over that obtainable with either component of the combination alone. One characteristic of the present invention is that the co-deposition of mercury in minute amounts with the plating metal.

3,663,243

COMPOSITION UTILIZED IN IMAGE DEVELOPMENT SYSTEM

Frederick J. Stryker, San Jose, and Otto Kornei, Monte Sereno, both of Calif., assignors to The United States of America as represented by the Secretary of the Army

Original application Mar. 26, 1968, Ser. No. 716,236, now Patent No. 3,558,338. Divided and this application May 20, 1970, Ser. No. 38,610

Int. Cl. C09k *3/00*

U.S. Cl. 106—14.5 **1 Claim**

An image developing composition containing an alkali metal iodide salt and a liquid vehicle.

3,663,244

HIGH DURABILITY LEAD TITANATE-CONTAINING ENAMEL FOR GLASS CERAMICS

Francis Willis Martin, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 28, 1970, Ser. No. 32,563

Int. Cl. C03c *5/02*

U.S. Cl. 106—49 **2 Claims**

This invention relates to a method of making and applying a thermally devitrifiable glass enamel for decorating or protecting glass-ceramic ware which has a high resistance to acid and alkaline attack and improved resistance to impact and abrasion.

3,663,245

FOREHEARTH COLOR CONCENTRATE

Robert O. Bryson, Euclid, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Oct. 31, 1969, Ser. No. 873,129

Int. Cl. C03c *3/04, 1/00, 1/10*

U.S. Cl. 106—52 **8 Claims**

Forehearth color concentrates for coloring molten clear base glass in a glass furnace forehearth after melting and fining, comprising a non-smelted interspersion of a flux and colorant. Suitable fluxes are those materials which are compatible with the glass and which promote the fusion and dispersion of the colorant. Suitable fluxes include the alkali borates, boric acid, alkali phosphates, orthophosphoric acid, alkali silicates, fluosilic acid, alkali fluorides, alkali salts, alkali hydroxides, mixtures and reaction products of said fluxes. Alkali silicates and particularly sodium silicates are preferred. Suitable colorants include color indicating metals, color inducing metal oxides or compounds which contain a color inducing metal oxide.

3,663,246

GLASS FOR TELEVISION DISPLAY CATHODE-RAY TUBES

Coenraad Maria La Grouw, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1969, Ser. No. 868,611

Claims priority, application Netherlands, Oct. 28, 1968, 6815397

Int. Cl. C03c *3/04, 3/10;* **H01i** *29/10*

U.S. Cl. 106—53 **2 Claims**

Glass for envelopes of television display cathode-ray tubes, particularly screen glass for color television, which transmits at most 0.5 mr/h of X-ray radiation at an acceleration voltage of 40 to 45 k. volt, and which has a composition in percent by weight:

SiO_2	58–67	PbO	2–7
Li_2O	0–1	MgO	0–3
Na_2O	2–3	Al_2O_3	1–4
K_2O	11–14	$As_2O_3 \pm Sb_2O_3$	0.3–0.7
CaO	3–4.5	CeO_2	0.05–0.6
BaO	11–14		

3,663,247

GLASS

Hendrikus Johan Lodewijk Trap, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1969, Ser. No. 873,091

Claims priority, application Netherlands, Nov. 9, 1968, 6816004

Int. Cl. C03c *3/04, 3/10;* **H01j** *43/00*

U.S. Cl. 106—53 **2 Claims**

Glass particularly suitable for use in a secondary emission electrode, after adjustment of the surface conductivity by heating in a reducing atmosphere, and having a composition in percent by weight within the range limited as follows:

SiO_2	30–70	PbO	6–30
Al_2O_3	0.5–10	Bi_2O_3	2–45
B_2O_3	≤ 5	CaO + SrO	≤ 8
Na_2O	≤ 6	MgO	0.5–7
K_2O	≤ 10	Sb_2O_3	≤ 2.

3,663,248

SINTERED CERAMIC BODY CONTAINING RESIDUAL CARBON, AND PROCESS FOR PREPARING IT

Kaoru Umeya, Sendai-shi; Shunji Tanaka, Ilayama, and Shinpei Gomi, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha and Kyushu Taika Renga Kabushiki Kaisha, Tokyo, Japan

Filed June 12, 1969, Ser. No. 832,811

Claims priority, application Japan, June 12, 1968, 43/39899

Int. Cl. C04b *35/04*

U.S. Cl. 106—58 **4 Claims**

A sintered ceramic body containing residual carbon is prepared by adding to a pitch body containing a special petroleum pitch as a fine powder inorganic powder granules, then kneading, pressure molding, and reduction calcinating the thus molded body. If necessary, a liquid tar fraction other than the special pitch can be added. It is higher in mechanical strength and chemical resistance at a high temperature and is very useful as a refractory.

3,663,249

METHOD FOR INSOLUBILIZING SODIUM SILICATE FOAM

Ramesh P. Rao, Sarnia, Ontario, Canada, assignor to Fiberglas Canada Limited, Toronto, Ontario, Canada

Continuation-in-part of application Ser. No. 875,568, Nov. 10, 1969, now abandoned. This application Mar. 24, 1970, Ser. No. 22,373

Int. Cl. C04b *21/00;* **F16l** *59/00*

U.S. Cl. 106—75 **9 Claims**

Insoluble silicate foams which exhibit good permanence and weather resistance for use in structural applications may

be produced by foaming a dry reaction mixture of hydrated silicate and complexing agent which has been prepared by mixing particulate alkali metal or alkaline earth metal silicate and the complexing agent and treating tat mixture with saturated steam at the hydration temperature of the silicate, thereby achieving uniform distribution and penetration of the reactants.

3,663,250

WATER-INSENSITIVE BONDED ASBESTOS STRUCTURES

Stephen A. Gerow, Glen Mills, Pa., and Verne Wesley Weidman, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 1, 1970, Ser. No. 42,557

Int. Cl. C04b *35/16, 43/04*

U.S. Cl. 106—84 **5 Claims**

Water-insensitive, insulating structures of fibrous asbestos bonded by an in situ-produced water-insoluble crystalline reaction product of asbestos and sodium or potassium silicate. Structures are obtained by mixing the fibrous asbestos with an aqueous solution of alkaline ionic silicate to make a damp fibrous mass, compacting the mass into a coherent article, and curing the article under controlled temperature and humidity conditions so as to maintain a water level in the article of at least 10 weight per cent, based on solids, for a period of time sufficient to produce the crystalline binder. After curing, the structures are dried, if necessary, to a water content below 20 percent based on solids.

3,663,251

ADDITIVE FOR CONCRETE AND MORTAR

Rolf Erhard Moren, Alfredshem, and Nils-Erik Ydren, Norrkoping, both of Sweden, assignors to Mo Och Domsjo Aktiebolag, Ornskoldsvik and Skanski Cementaktiebolaget, Malmo, Sweden

Filed July 14, 1969, Ser. No. 842,085

Claims priority, application Sweden, July 15, 1968, 9673

Int. Cl. C04b *7/02*

U.S. Cl. 106—90 **9 Claims**

The invention relates to an additive or mixture for improving the workability and strength and reducing the air content of inorganic binder, and especially hydraulic cement-containing compositions such as concrete and mortar. The additive comprises sulphite waste liquor and certain polyalkylene glycols and their derivatives. The invention also relates to the binder-containing compositions comprising the additive and methods of making the same.

3,663,252

METHOD FOR STABILIZING ALUMINOUS CEMENTS AND CEMENTS OBTAINED

Paul Stiglitz, Buisson; Gerard Sadran, and Henri De Saint-Chamant, both of Paris, all of France, assignors to Societe Anonyme Ciements Lafarge, Paris, France

Filed July 24, 1968, Ser. No. 747,100

Claims priority, application France, July 31, 1967, 166377; 166378

Int. Cl. C04f *7/32*

U.S. Cl. 106—104 **5 Claims**

A process for the stabilization of aluminous cements is disclosed wherein a substance is added to the anhydrous cement mixture to prevent the formation of cubic aluminate and free water in the cement. Substances capable of forming alkaline earth carbonates, or hydroxy carbonates or precursors thereof, the natural and synthetic calcium borates, organic complexing agents for aluminum, diamino-benzene, and o-aminophenol and ethers, esters, ammonium salts and anhydrides of the complexing agents, diamino-benzene, and o-aminophenol may be used. The amount of carbonate-containing or carbonate-forming substance which is added should be sufficient to correspond to an addition of alkaline earth carbonate of about 10 percent by weight based upon cement. The amount of calcium borates which may be added ranges from 2 percent to 5 percent and the amount of organic complexing agent, diaminobenzene and o-aminophenol or the respective ether, ester, ammonium salt or anhydride which are added should be about 0.1 percent to 0.5 percent.

3,663,253

DETERRENT COMPOSITIONS

Rufus John Stone, 19 Brunsall Street, London, S.W. 3, England

Continuation-in-part of application Ser. No. 759,216, Sept. 11, 1968, now abandoned. This application Oct. 8, 1969, Ser. No. 864,890

Claims priority, application Great Britain, Oct. 15, 1968, 48,720/68

Int. Cl. C08b *25/00*

U.S. Cl. 106—204 **14 Claims**

An animal deterrent composition comprising a major proportion of a finely divided animal deterrent compound of aluminum together with a minor proportion of one or more of certain specified organic animal deterrent compounds. The invention also consists in a method of deterring animals using the composition of the invention.

3,663,254

AQUEOUS COATING COMPOSITIONS FOR GLASS ARTICLES

Robert C. Wade, Ipswich, Mass., assignor to Ventron Corporation, Beverly, Mass.

Filed Feb. 22, 1971, Ser. No. 117,828

Int. Cl. C08h *9/06;* **C03c** *17/22*

U.S. Cl. 106—271 **3 Claims**

Improved coating compositions of unusual durability for protection of glassware from scratching and which may be applied to the ware by a single application as the ware emerges from the cool end of the annealing lehr are disclosed. The coating compositions are water solutions of ammonium zirconyl carbonate and a colloidally dispersed polyethylene of low molecular weight of between about 1,200 and 2,000.

3,663,255

COMPOSITION CONTAINING CHLORINATED HYDROCARBONS KETONES AND GLYCOL ETHERS, FOR REFLOWING ORGANIC SURFACES

Thomas A. Vivian, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 844,662, July 24, 1969, now abandoned. This application Dec. 1, 1969, Ser. No. 881,284

Int. Cl. C08h *7/22*

U.S. Cl. 106—285 **12 Claims**

Compositions for reflowing organic surfaces, such as paints and polystyrene, have been discovered which contain by volume 50 to 90 percent of a liquid chlorinated aliphatic hydrocarbon, 5 to 30 percent of a liquid ketone or alcohol, 2 to 20 percent of glycol ether alkanoate and 0 to 30 percent of an alkyl alkanoate, all of such components having a boiling point below 200° C.

ERRATA

For Classes 106—279 thru 106—315 see:
Patent Nos. 3,663,281 thru 3,663,287

3,663,256

MARK-FORMING RECORD MATERIAL

Robert E. Miller, and Bruce W. Brockett, both of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

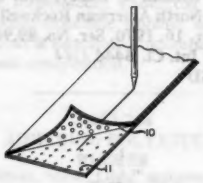
Continuation-in-part of application Ser. No. 744,569, July 12, 1968, now abandoned. This application May 26, 1969, Ser. No. 830,921

Int. Cl. B41m *5/22*

U.S. Cl. 117—36.2 **24 Claims**

This disclosure is directed to mark-forming record material containing two essential color-forming reactants which

produce color upon contact with one another in the presence of a mutual liquid solvent wherein (A) one of said color-forming reactants is a phenolic resin containing at least 70 percent, by weight, of oil-soluble, amorphous, free-hydroxy-group-containing, room-temperature-solid, thermoplastic polymeric condensates of formaldehyde and at least one p-substituted phenol of which at least 10 percent, by weight, is a p-substituted phenol wherein the p-substituent is electron-attracting (for example, a p-halo-substituent), said polymeric condensates containing at least three p-substituted phenol units per molecule, and wherein (B) the other essential color-forming reactant is a basic chromogenic material; for example, Crystal Violet Lactone. The polymeric condensates of (A) may be a mixture of polymer chains, each polymer chain having three or more of the same or different recurring p-substituted phenol units per molecule with methylene



bridges between adjacent p-substituted phenol units. Where the polymer resin of (A) is not entirely composed of condensates having recurring phenolic units bearing p-electron-attracting substituents, the remaining recurring phenolic units bear p-electron-donating substituents; for example, p-alkyl substituents.

A preferred form of mark-forming record material combines in the same polymeric resin, either in the same molecule or in a mixture of molecules, phenolic units bearing electron-attracting and -donating substituents; for example, a phenolic resin having p-halo groups as the electron-attracting substituents and p-alkyl groups as the electron donor substituents. By so blending electron-attracting and -donating groups, a "balanced" condensate (or mixture of condensates) having improved properties as a record material is achieved.

3,663,257

TRANSPARENT HEAT-SENSITIVE FILM

Joseph A. Wiese, Jr., and George Van Dyke Tiers, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 16, 1970, Ser. No. 90,119
Int. Cl. B41m *5/22*
U.S. Cl. 117—36.8 **9 Claims**

A clear transparent film, which gives a color projection image when thermographically heated, contains a protonatable chromogenous dye-forming color progenitor together with a salt of a strong organic acid and a strong base in a transparent heat-decomposable halogen-containing polymeric binder.

3,663,258

HEAT-SENSITIVE COPY-SHEET

Joseph A. Wiese, Jr., and Rex J. Dalzell, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 16, 1970, Ser. No. 90,120
Int. Cl. B41m *5/22*
U.S. Cl. 117—36.8 **4 Claims**

A coating composition containing a dye, such for example as Genacryl Orange, and tetramethylguanidine trichloroacetate in a solution of inert binder at a pH not higher than 3 is applied to a carrier sheet to form a colored coating which on brief standing becomes colorless and heat-sensitive.

3,663,259

COATED BOTTLES

Jacqueline Barriere, Neuilly sur Seine, France, assignor to Societe dite Courreges Parfums

Filed Mar. 30, 1970, Ser. No. 23,746
Int. Cl. B44d *5/06, 5/00*
U.S. Cl. 117—37 R **10 Claims**

Glass bottle having neck and engraved or relief design on its outer surface is coated with coating of transparent plastic which increases in thickness from the neck to the opposite end of the bottle. The bottle may be closed by a cap made in the same way.

3,663,260

TALC FILLED METALLIZABLE POLYOLEFINS

Wassily Poppe, Lombard, Ill.; Habet M. Kheighatian, Springfield, and Anthony J. Lutz, Jr., Chester, both of Pa., assignors to Standard Oil Company, Chicago, Ill.

Filed July 20, 1970, Ser. No. 56,724
Int. Cl. C23b *5/62*
U.S. Cl. 117—47 A **9 Claims**

Metallizable polyolefin compositions are provided by incorporating into a polyolefin from about 1 percent to about 50 percent by weight, based on the weight of the polyolefin, of a finely-divided talc having a platey (micaceous) or massive (granular) particle shape and having an average particle size of from about 0.4 microns to about 40 microns. The aforementioned talc filled polyolefin compositions may be metallized by electroplating or other metallizing processes to form metallized shaped articles.

3,663,261

METHOD FOR PREPARING PLASTIC IMPREGNATED WOOD BY RADIATION POLYMERIZATION

Jorma Miettinen; Timo Autio, and Juhani Stromberg, all of Helsinki, Finland, assignors to Prof. Jorma Kalervo Miettinen, Helsinki, Finland

Filed Feb. 19, 1968, Ser. No. 706,645
Claims priority, application Finland, Feb. 23, 1967, 548/67
Int. Cl. B27k *3/50;* B44d *1/28, 1/50*
U.S. Cl. 117—59 **1 Claim**

The present invention relates to a method for preparing plastic impregnated wood, in which dry wood (moisture content below 10 percent) is impregnated with liquid resin material in a manner prior known per se e.g. the wood is put into a vacuum impregnation vessel, the air is evacuated, the vessel flushed with nitrogen, the liquid resin is introduced in the vessel until the wood is immersed, an atmospheric nitrogen pressure or an overpressure of 1 to 8 atmospheres gauge is applied. The wood is transferred into bags or containers filled with nitrogen, then hermetically sealed, then the impregnated wood is cured utilizing radioactive radiation optionally in the presence of chemical catalyst addition. The resin utilized for the wood impregnation contains commercial unsaturated polyester between 35 and 95 percent and styrene and/or methyl methacrylate. The amount of radiation is between 0.5 and 1.5 Mrad in the case of gamma radiation and between 1 and 5 Mrad if high energy electron radiation is used. As chemical catalyst is used an organic peroxide and

the curing is carried out at a temperature between 40° and 60° C. utilizing as additives when necessary chemical inhibitors such as pinene in an amount of less than 5 percent.

3,663,262

FUGITIVE COLORATION OF SOLID MATERIALS WITH DYES

Jerry A. Cogan, Jr., Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 12, 1969, Ser. No. 798,815
Int. Cl. B44d *1/44*
U.S. Cl. 117—62.1 **14 Claims**

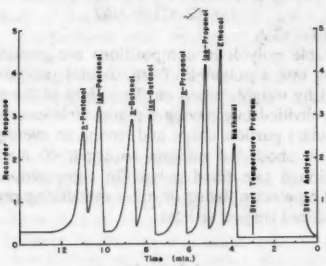
A process for repeatedly tinting and changing the color of solid materials which comprises applying a polymeric composition to the material and thereafter contacting the treated material with a dye which has a higher affinity for the polymeric composition than the material. In this manner the dye is temporarily fixed on the material and can be removed by washing in a detergent solution. The dyeing and removing steps can be repeated.

3,663,263

METHOD OF PREPARING CHROMATOGRAPHIC COLUMNS

Robert J. Bodre, and Kirby Allan Pinkerton, both of Texas City, Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 3, 1969, Ser. No. 813,144
Int. Cl. C01n *31/08*
U.S. Cl. 117—63 **16 Claims**



A method of preparing chromatographic columns of the Golay type having substrates of porous polymeric materials which comprises coating the inside surface of a tubular member with a mixture comprising one or more polymerizable monomers, at least one of which is a polyvinyl monomer, and a solvent which is miscible but nonreactive with said monomer, polymerizing the monomer or monomers and removing any unreacted components.

3,663,264

PROCESS OF MANUFACTURING COATED REINFORCED CAST RESIN AND RESULTANT ARTICLE

Ludwig Wesch, Heidelberg, Germany, assignor to Mancar-Trust, Vaduz, Liechtenstein

Continuation-in-part of application Ser. No. 651,125, July 5, 1967, now abandoned. This application Jan. 9, 1970, Ser. No. 1,869
Int. Cl. B32b *17/04, 1/08;* B44d *1/16*
U.S. Cl. 117—68 **14 Claims**

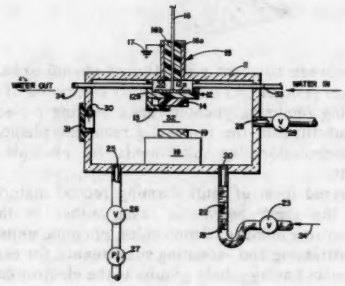
A reinforced cast resin formed from polyester, epoxide or butadiene-styrene resins and containing curing catalysts and accelerators for the cast resin are coated with a protective coating of a synthetic rubbery polymer selected from polybutadiene, polyacrylonitrile, polystyrene, butadiene-acrylonitrile copolymer, butadiene-styrene copolymer or mixtures thereof which contain curing agents and accelerators for the rubbery polymer. The curing catalysts and accelerators for the cast resin and the curing agents and accelerators for the rubbery polymer are different but selected such that they react and function within the same temperature range, and the cast resin is polymerized and cured simultaneously with the vulcanizing and curing of the synthetic rubbery polymer. The protective coating may be provided on both surfaces of the cast resin with each coating having an additional layer of polyvinyl chloride or polyethylene positioned between the protective coating and the cast resin.

3,663,265

DEPOSITION OF POLYMERIC COATINGS UTILIZING ELECTRICAL EXCITATION

Stuart M. Lee, and William A. Bailey, both of Orange Co., Calif., assignors to North American Rockwell Corporation

Filed Nov. 16, 1970, Ser. No. 89,969
Int. Cl. B44d *1/44*
U.S. Cl. 117—93.1 GD **2 Claims**



An electric deposition process providing a glow discharge by virtue of electrical energy fields provided internal to a deposition chamber enables with one step to provide a protective coating of a surface of a substrate material by repolymerizing a polymer solid starting material. A carrier gas such as argon, xenon or krypton is used in the deposition chamber for the energy field to act upon it, provide the glow and cause the glowing gas to volatilize particles of the starting material and be deposited as the protective coating on the substrate.

3,663,266

MOISTURE RESPONSIVE SYNTHETIC MICROPOROUS SHEET MATERIAL

John I. Dye, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 21, 1970, Ser. No. 39,531
Int. Cl. D06n *3/00, 3/08*
U.S. Cl. 117—76 **12 Claims**

A coriaceous vapor permeable microporous sheet material that absorbs water and expands under moist conditions is the subject of this invention. The novel material is particularly useful for making shoes and boots and provides better comfort and appearance than natural leather. The novel coriaceous material has a coating of a microporous polymer which is in firm adherence to a substrate of a polymer impregnated non-woven synthetic fibrous web. The novel sheet material under high humidity conditions as occur when a shoe or boot is worn has a particular moisture absorption, area expansion, and a decrease in tensile stress and also has a high permeability to water vapors. These particular characteristics provide a high degree of comfort to the wearer of shoes or boots made from the novel sheet material of this invention.

3,663,267

ARTICLE COATED WITH INTUMESCENT UNDERCOAT OF A SYNTHETIC RESIN, INORGANIC FOAM FORMING AGENT AND CARBON FORMING AGENT AND WATER-INSOLUBLE ORGANIC SOLVENT BASED RESIN OVERCOAT

William F. Moran, Randallstown, and Lucian C. Kyrias, Baltimore, both of Md., assignors to Beatrice Foods Co., Chicago, Ill.

Continuation of application Ser. No. 680,343, Nov. 3, 1967, now abandoned. This application Sept. 9, 1970, Ser. No. 70,725

Int. Cl. B44d *1/14*; C08g *37/32*, *51/14*

U.S. Cl. 117—76 P 6 Claims

An article having a fire resistant coating which includes an intumescent undercoat of an aqueous mixture of a synthetic resin, an inorganic foam forming agent and a carbon forming agent. Over the intumescent undercoat there is applied a nonflammable water-insoluble organic solvent based resin. This latter overcoat is essentially incompatible with the intumescent undercoat composition.

3,663,268

PROCESS FOR ADHERING POLYESTER TIRE CORD TO RUBBER

Matthew W. Wilson, Stow, Ohio, assignor to B. F. Goodrich Co., New York N.Y.

Filed May 25, 1970, Ser. No. 40,381

Int. Cl. B32b *27/36*

U.S. Cl. 117—76 T 6 Claims

Synthetic textile tire cords, particularly polyester tire cords, are adhered to elastomeric tire stocks by a process involving (1) dipping the cords into a noncuring phenol-aldehyde liquid resin (2) heating to accomplish wetting of the outside filaments of the said cords with said resin, (3) dipping the cords into a resorcinol-formaldehyde-latex dip, (4) heating to dry the twice dipped cord and (5) heating the treated cord in contact with the desired elastomeric stock under pressure as the said stock is vulcanized.

3,663,269

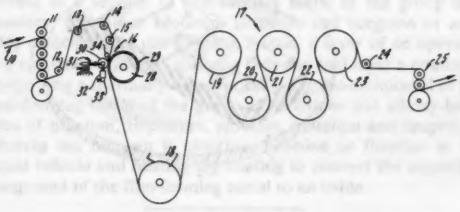
SELF RELEASABLE NONMOISTURE ACTIVATED WALL COVERING

Raymond P. Fischer, Wheaton, Ill., and John F. Whalen, Appleton, Wis., assignors to Combined Paper Mills, Inc., Combined Locks, Wis.

Filed May 22, 1968, Ser. No. 731,025

Int. Cl. C09j *7/04*

U.S. Cl. 117—76 A 2 Claims



A wall covering, such as wallpaper, having a coating of dry, encapsulated adhesive on the back surface which is made tacky by the application of heat and/or pressure in the absence of moisture, and a method of manufacturing wallpaper which includes applying the encapsulated adhesive in the paper making machine or in a separate coating operation.

3,663,270

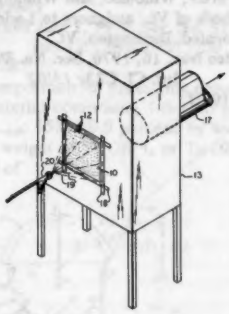
BRAZING STOP-OFF TREATMENT OF PERFORATED METAL SHEETS

Winford Blair, La Mesa, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Apr. 20, 1970, Ser. No. 30,014

Int. Cl. B44d *1/08*, *1/02*

U.S. Cl. 117—98 5 Claims



A thin, perforated, metal sheet, one side of which is to be brazed to another element, has the other side thereof treated to prevent braze alloy from flowing into and through the perforations by spraying said other side of the sheet with a nonrunny or thixotropic braze stop-off compound while at the same time maintaining a gentle flow of air or other gas through the perforations in the sheet in the direction of spray flow so as to carry away particles of spray material which pass through the perforations and thereby prevent such spray particles from contaminating the brazing side of the sheet.

3,663,271

SURFACE-MODIFIED ACID CRYSTALS AND PROCESS FOR THEIR PREPARATION

Gerhard Gergely, Vienna, Austria, assignor to Organon Inc., West-Orange, N.J.

Filed Mar. 26, 1970, Ser. No. 23,005

Claims priority, application Germany, Mar. 26, 1969, P 19 15 509.0

Int. Cl. C07c *55/02*

U.S. Cl. 117—100 A 11 Claims

The invention relates to acid crystals the surface of which consists at least partially of a dehydrated water soluble salt. The preparation thereof is characterized in that the acid crystals are mixed with a metal oxide or hydroxide and the obtained mixture is reacted under substantially anhydrous conditions in the presence of traces of water. These modified crystals are very suitable to use as the acidic component in various mixtures, e.g. in effervescent mixtures, as these crystals can absorb some moisture without starting the carbon dioxide development. Tablets containing the acid crystals of the invention are hard when freshly prepared and show the tendency to gain in hardness on exposure to the atmosphere for some days. Moreover they are completely water-soluble with a delayed acid release.

3,663,272

PROCESS FOR KILLING MICROORGANISMS IN AN AQUEOUS TEXTILE FINISH

LeMoyne W. Plischke, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed June 24, 1970, Ser. No. 49,547

Int. Cl. B05c *11/10*

U.S. Cl. 117—102 A 10 Claims

In a system for the application of a liquid aqueous textile finish, the concentration of living microorganisms in the

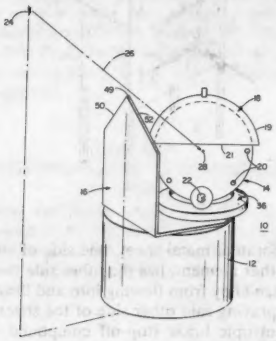
finish can be held below the level necessitating frequent system clean-ups by heating the finish to between 57° C. and about 100° C. for between about 0.1 percent and about 2 percent of the average residence time of the finish in the system.

3,663,273

TILTING VARIABLE SPEED ROTARY SHADOWER

John Halsted Porter, Winooski, and William Alexander Ladd, Burlington, both of Vt., assignors to Ladd Research Industries, Incorporated, Burlington, Vt.

Filed Nov. 16, 1970, Ser. No. 89,575
Int. Cl. C23c *13/02*
U.S. Cl. 117—107.1 **2 Claims**



Method to effect uniform vapor deposition on a specimen by continuously exposing the specimen to a vapor beam while imparting precessional motion to the specimen, including positions wherein the specimen major surface faces said beam at 90° thereto and wherein the specimen edge portions are at 90° to the beam, and while variably shielding the specimen during its precessional motion.

3,663,274

METHOD OF MINIMIZING ACCUMULATION OF ELECTROSTATIC CHARGE ON POLYETHYLENE

Burton P. Block, Wayne; Oliver S. Sprout, Jr., Glenside, and Gerd H. Dahl, King of Prussia, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 3, 1970, Ser. No. 43,178
Int. Cl. B32b *27/32*; D06m *15/62*
U.S. Cl. 117—138.8 E **3 Claims**

Subject disclosure relates to the use of poly (metal phosphinates) as electrostatic discharge agents on polyethylene and other polymeric surface materials. More specifically, zirconium dihydroxy dibutylphosphinate dioctylphosphinate and chromium aquo hydroxy dibutylphosphinate and/or chromium aquo hydroxy methylphenylphosphinate are deposited from a solvent such as chloroform to provide an antistatic coating on the polymeric material.

3,663,275

COATED FILLED REGENERATED CELLULOSE FILM

Daniel Kenyon Owens, Bon Air, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 30, 1970, Ser. No. 51,392
Int. Cl. B32b *23/08*, *23/04*; C08j *1/38*
U.S. Cl. 117—144 **3 Claims**

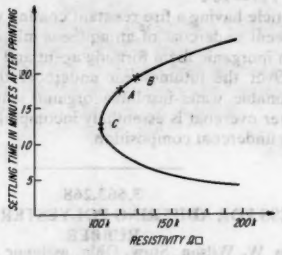
A process for preparing coated regenerated cellulose film in which bentonite clay is admixed in a cellulose xanthate viscose prior to extrusion, followed by preparing a regenerated film from the viscose and applying a polymeric coating to at least one surface of the regenerated film, as well as the resulting coated products, characterized by improved winding properties.

3,663,276

METHOD OF ADJUSTING THE RESISTIVITY OF THICK-FILM SCREEN-PRINTED RESISTORS

Trevor Richard Allington, and James Richard McClellan, both of Indianapolis, Ind., assignors to RCA Corporation

Filed May 25, 1970, Ser. No. 40,091
Int. Cl. B44d *1/18*, *1/02*; H01b *1/02*
U.S. Cl. 117—201 **5 Claims**



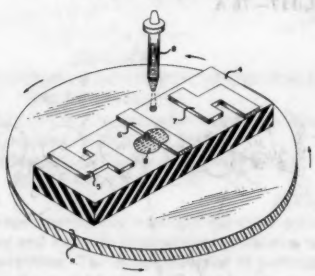
Method of adjusting the resistivity of a thick-film resistor of the type made by screen printing on a substrate a composition comprising metal particles, glass frit, a temporary organic binder and a temporary solvent, drying to remove the solvent, and firing the composition to fuse the glass frit and burn off the binder, said method comprising determining the relationship between the resistivity of the fired composition and the drying time that elapses between screen printing the composition on the substrate and the beginning of the firing cycle, and setting this elapsed time in accordance with a desired resistivity value.

3,663,277

METHOD OF INSULATING MULTILEVEL CONDUCTORS

Ronald L. Koepp, Dayton, Ohio, and Janos Havas, Wappingers Falls, N.Y., assignors to The National Cash Register Company, Dayton, Ohio

Filed Aug. 4, 1969, Ser. No. 847,153
Int. Cl. B44d *1/02*; C23d *5/02*; H01j *1/13*
U.S. Cl. 117—201 **1 Claim**



The present invention relates to a method of forming a thin stratified pinhole-free silicon dioxide insulator layer between multilevel conductors. Silicon dioxide films within the stratified pinhole-free silicon dioxide insulator layer are made from single drops of colloidal silicon dioxide liquid dispersion. These silicon dioxide films are stacked to form a stratified pinhole-free highly insulative silicon dioxide layer between the upper and lower conductors. The thinness of the stratified pinhole-free silicon dioxide insulator layer allows shallow contact windows to be formed therein. A shallow

contact window allows reliable electrical contact therethrough between an upper conductor and a lower conductor.

3,663,278

THERMAL TRANSFER MEDIUM FOR PRODUCING SCRATCH AND SMUDGE RESISTANT MARKS

James H. Blose, Xenia; William F. Pinell, Lebanon, and Shashikant G. Talvalkar, Dayton, all of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Nov. 30, 1970, Ser. No. 93,800

Int. Cl. B41m *5/10*

U.S. Cl. 117—234 **15 Claims**

A thermal transfer medium comprising a base having a transferable coating composition thereon. The coating composition comprises about 3 to 40 percent by weight of a cellulosic polymer; about 15 to 70 percent by weight of a thermoplastic aminotriazine-sulfonamidealdehyde resin; about 3 to 40 percent by weight of a plasticizer; and about 1 to 45 percent by weight of a sensible material.

3,663,279

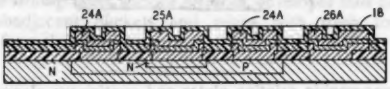
PASSIVATED SEMICONDUCTOR DEVICES

Martin P. Lepselter, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 19, 1969, Ser. No. 878,105

Int. Cl. H01l *7/00*

U.S. Cl. 117—212 **6 Claims**



Coatings of refractory metal oxides are provided over the surface of semiconductor devices for chemical and mechanical passivation. The oxide coatings are formed by depositing a layer of refractory metal and oxidizing in situ. In a specific example, the refractory metal is zirconium.

3,663,280

ELECTRODES FOR ELECTROCHEMICAL PROCESSES

Denis Lee, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 17, 1969, Ser. No. 807,993

Claims priority, application Great Britain, Apr. 2, 1968, 15,786/68

Int. Cl. B44d *1/18*

U.S. Cl. 117—217 **28 Claims**

A method for the manufacture of an electrode for use in electrochemical processes, which comprises forming on the surface of a support of film-forming metal of the group of titanium, zirconium, niobium, tantalum and tungsten or an alloy principally of one of these metals, a layer of an operative electrode material, applying over the said layer a coating comprising a thermally decomposable organo-compound of a film-forming metal of the group of alkoxides and alkoxy-halides of titanium, zirconium, niobium, tantalum and tungsten wherein the halogen is chlorine, bromine or fluorine in a liquid vehicle and heating the coating to convert the organo-compound of the film-forming metal to an oxide.

3,663,281

ASPHALTIC COMPOSITION

Eugene M. Fauber, 6941 Stateline Avenue, Hammond, Ind.

Continuation-in-part of application Ser. No. 727,075, May 6, 1968, now abandoned. This application Nov. 4, 1970, Ser. No. 86,974

Int. Cl. C08h *13/00, 17/22*; C08i *1/46*

U.S. Cl. 106—279 **8 Claims**

Asphaltic compositions are prepared having suitable softening points, needle penetration and stain values for use in paper laminates. These compositions are prepared by air-blowing a blend of a major amount of asphalt and a minor amount of foots oil derived from slack wax from a medium lubricating oil distillate.

3,663,282

COATING COMPOSITIONS FOR ALKALI SURFACES

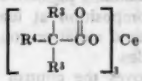
Ronald L. Smith, Ballston Lake, N.Y., assignor to General Electric Company

Filed July 1, 1970, Ser. No. 51,731

Int. Cl. C09d *3/82, 3/00*

U.S. Cl. 106—287 **14 Claims**

A primer composition for protecting polysiloxane polymers from alkali material comprising 1.0–10.0 percent by weight of $(RO)_nSiO_{(4-n)/2}$; 15.0–40.0 percent by weight of $(R'O)_4Si$; 1.0–10.0% by weight of $Ti(OR^2)_4$ or $Ti(OR^2)_x$; 1.0–5.0 percent by weight of



and 35–72 percent by weight of a solvent wherein R, R′, R^2, R^3, R^4, and R^5 are monovalent hydrocarbon radicals, x is at least 5 and the value of n may vary from 2.25 to 2.67.

3,663,283

PROCESS AND APPARATUS FOR THE PRODUCTION OF FINELY-DIVIDED METAL OXIDES

Richard A. Hebert, 14 Belmont Drive, Chelmsford, Mass.; Daniel J. Moynihan, 19 Union St., Watertown, Mass.; Donald E. Paul, Davidson Road, Boxboro, Acton, Mass.; Louis J. Petrovic, 7 Captain Parker Arms, Lexington, Mass.; Peter A. Rubel, Annursnac Hill Road, Concord, Mass., and Ralph Seferian, 335 Highland Ave., Winchester, Mass.

Filed Oct. 2, 1969, Ser. No. 863,146

Int. Cl. C08h *17/04*

U.S. Cl. 106—288 **22 Claims**

There is provided an improved process and apparatus for the production of finely-divided metal and metalloid oxides. The invention is generally characterized by the injection of a vaporized metal halide feedstock through a plurality of circumferential orifices and substantially perpendicularly into a plug flow stream comprising heated oxidant gas. Additionally, thin sheeted streams of a purge gas are directed into said oxidant gas stream at loci positioned substantially immediately above and below the locus of the metal halide vapor injection.

3,663,284

TITANIUM DIOXIDE SUSPENSIONS

Dimitri J. Stancioff, Camden, Maine, and Henry J. Witt, Mine Hill, N.J., assignors to Marine Colloids, Inc., Springfield, N.J.

Filed Jan. 9, 1970, Ser. No. 1,870

Int. Cl. C09c *1/36*

U.S. Cl. 106—300 **9 Claims**

For facilitating handling and shipment titanium dioxide pigment is prepared in the form of an aqueous suspension wherein the concentration of the titanium dioxide is from about 40 percent to about 80 percent by weight of the suspension and as an agent which retards settling and packing there is included in the suspension about 0.04 percent to about 0.4 percent by weight of the suspension a water-soluble additive selected from the group of substances consisting of citric acid, tartaric acid, the sodium, potassium and ammonium salts and acid salts of citric and tartaric acids, and mixtures of said substances with each other. Preferably, as an agent which further retards settling, there is included in the suspension a gum that is in an amount not greater than about 0.4 percent by weight of the suspension

and that in the amount used does not induce substantial gelation of the suspension. It likewise is preferable to include in the suspension from about 0.01 percent to about 0.1 percent by weight of the suspension of a sequestering agent for calcium cations.

3,663,285

WETTING AGENT-CONTAINING PIGMENT COMPOSITION

Hans Graf, Niederrodenbach, and Dieter Riffel, Frankfurt, both of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Germany

Filed July 28, 1969, Ser. No. 846,654
Claims priority, application Germany, July 27, 1968, P 17 92 148.1
Int. Cl. C08h *17/04*
U.S. Cl. 106—308 Q **9 Claims**

A wetting agent-containing pigment composition is formed by adding to the composition at least one pyrogenically produced and coagulated metal or non-metal oxide or a co-coagulate of such oxides.

The addition improves the control of the action of the wetting agent, inhibits the tendency to form agglomerates and acts as an aid in grinding the composition.

3,663,286

ADJUVANT COMPOSITION FOR CONCRETES AND MORTARS

Andre De Barrau, Paris, France, assignor to Gerard Henri Jules Leruste, Paris, France, a part interest

Filed Feb. 26, 1970, Ser. No. 14,673
Int. Cl. C04b *13/22*
U.S. Cl. 106—314 **8 Claims**

Adjuvant composition for concretes and mortars adapted to be dissolved in the mixing water. This composition consists basically of an aqueous mixture of at least four inorganic salts, viz, a borate, a sulfite, a nitrate, and a hyposulfite. Particularly, it comprises sodium borate, sodium sulfite, potassium nitrate and sodium hyposulfite. A particular formulation is as follows:

water	500 ml
sodium borate	5 g
sodium sulfite	20 g
potassium nitrate	160 g
sodium hyposulfite	800 g

Applications to the production of mortars, concretes, aggregate, and any constructional material.

3,663,287

CEMENT ADDITIVE COMPRISING CALCIUM SULFO-ALUMINATE, AN ORGANIC ADHESIVE, A FOAMING AGENT, AND A DISPERSING AGENT

Tsutomu Mizunuma, and Tsukuru Azumi, both of Ohmi-Machi, Nishikubiki-gun, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 4, 1970, Ser. No. 69,945
Claims priority, application Japan, Nov. 4, 1969, 44/87627
Int. Cl. C04b *11/08, 11/14, 21/02*
U.S. Cl. 106—315 **5 Claims**

A cement additive consisting of 100 parts by weight of a mineral consisting mainly of calcium sulfo-aluminate, which forms ettringite having a high content of sulfate through hydration, 0.1 to 2.0 parts by weight of an organic adhesive, 0.005 to 0.5 part by weight of a blowing agent and 1.0 to 6.0 parts by weight of a dispersing agent is suitable for grout. This cement additive is preferred to be added with 0.5 to 10.0 parts by weight of an accelerating agent.

3,663,288

PHYSIOLOGICALLY ACCEPTIBLE ELASTOMERIC ARTICLE

Mary Lucy Miller, Alexandria, Va., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 4, 1969, Ser. No. 855,393
Int. Cl. A61m *25/00*
U.S. Cl. 117—7 **6 Claims**

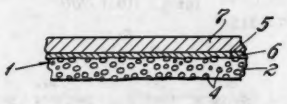
There is provided improved synthetic articles of manufacture which are physiologically acceptable when utilized in warm-blooded animals as medical devices. The articles of manufacture comprise extensible substrates coated with poly(acrylic acid) or poly(methacrylic acid).

3,663,289

PROCESS OF PRODUCING A PLANOGRAPHIC PRINTING PLATE AND RESULTANT ARTICLE

Douglas A. Newman, Glen Cove, N.Y., assignor to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

Continuation-in-part of application Ser. No. 800,414, Feb. 19, 1969, now abandoned. This application Apr. 6, 1970, Ser. No. 26,091
Int. Cl. B44d *1/14;* **B41n** *1/12*
U.S. Cl. 117—4 **7 Claims**



Planographic printing plates and continuous planographic printing forms having a flexible foundation supporting a planographic printing layer and process of making are disclosed. The flexible foundation is an opaque, thin sheet or continuous web or strip of synthetic thermoplastic polymer having uniformly rough, receptive surfaces, the foundation being selected from unicellular foamed film or normally-clear, normally-smooth film treated on both surfaces with volatile organic solvent having a dissolving power therefor. One surface of the film foundation is coated with a thin planographic layer.

3,663,290

TEMPERATURE RESISTANT COATING AND METHOD

James L. Klinge, Indianapolis, Ind., assignor to Klinge Enameling Company, Inc., Indianapolis, Ind.

Filed Dec. 17, 1969, Ser. No. 886,003
Int. Cl. B44d *1/08, 1/14, 1/46*
U.S. Cl. 117—8 **10 Claims**

A member is coated in three coating steps, including first and final coats of a clear solution of an alkali metal silicate, and an intermediate coat of an opaque solution of an alkali metal silicate, each coating followed by a high temperature cure. The concentration of silicate in solution is limited to avoid frosting and discoloration when subjected to heat. The clear solution includes clay and a binder for mar resistance and adhesion. The opaque solution includes a pigment and a binder.

3,663,291

CASCADE DEVELOPMENT

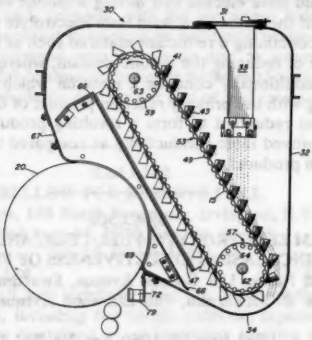
Stephen F. Royka, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Oct. 14, 1969, Ser. No. 866,320
Int. Cl. G03g *13/08, 15/08*
U.S. Cl. 117—17.5 **4 Claims**

Processes are provided for improving the mixing efficiency of carrier and toner in electrostatographic apparatus by causing a partial reverse cascade of developer from the buckets

of a bucket-type conveyor in the electrostatographic developing apparatus prior to said developer cascading across the electrostatographic surface whereby developer falls back upon subadjacent buckets and mixes with toner newly deposited therein.

An improvement in electrostatographic development apparatus is obtained by providing the buckets of the bucket-



type conveyor of the development apparatus with a plurality of apertures in the posterior wall of each bucket thereby obtaining buckets adapted to allow a partial egress of developer from said apertures prior to said developer cascading across the electrostatographic surface whereby developer falls back upon subadjacent buckets and mixes with fresh toner released from the toner dispenser.

3,663,292

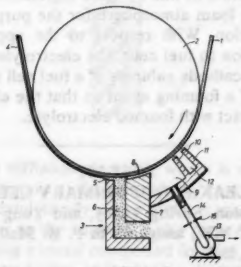
PROCESS FOR COATING STRIP-FORM SUBSTRATES

Peter Herzhoff, Leverkusen; Hans Gref, Cologne-Stammheim; Fritz Muas, Cologne-Flittard; Willi Wasser, Leverkusen; Kurt Browatzki, Opladen; Josef Friedsam, Langenfeld, and Wolfgang Schweicher, Leverkusen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 10, 1969, Ser. No. 797,800

Int. Cl. B05c *3/12;* **G03c** *1/74*

U.S. Cl. 117—34 **1 Claim**



A method of coating a strip of viscous solution on a movable substrate by feeding the coating solution through a narrow gap between coating apparatus which includes feed means and the movable substrate under a static pressure differential between the inlet and the outlet of the gap wherein the gap is part of a coating chamber of the coating apparatus. The gap is wider than the wet formed layer after formation. The coating chamber is connected to a vacuum means at the side of the coating from which the substrate is introduced. A negative pressure is effectuated at the inlet side of the coating apparatus. The vacuum means having a vacuum which seals the inlet end of the narrow gap in the coating apparatus by sucking air from the vacuum means through a diaphragm which withdrawal is at a uniform rate of flow.

3,663,293

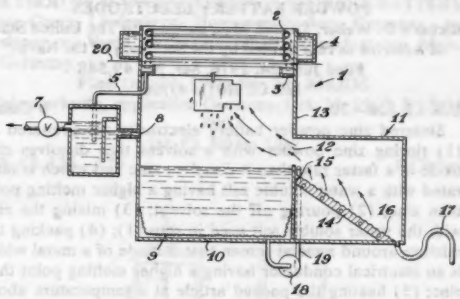
VAPOR GENERATING APPARATUS FOR VAPOR DEGREASING PROCESS

Kenneth S. Surprenant, Midland, and Raymond T. Gerard, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of application Ser. No. 741,520, July 1, 1968, now abandoned. This application July 16, 1970, Ser. No. 56,237

Int. Cl. B08b *5/00*

U.S. Cl. 134—11 **2 Claims**



A method and apparatus for continuously producing solvent vapors for degreasing metal parts and simultaneously purifying the solvent by directing liquid solvent which contains high boiling impurities onto a gravity flow heat exchange surface thereby to vaporize the low boiling solvent away from the high boiling impurities as the solvent flows across the heat exchange surface.

3,663,294

BATTERY EMPLOYING AN ALKALI METAL POLYSULFIDE HAVING A LOW ALKALI METAL HYDROXIDE CONTENT

Charles A. Levine, Concord, and George S. Fujioka, Walnut Creek, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 1, 1970, Ser. No. 51,681

Int. Cl. H01m *35/02*

U.S. Cl. 136—6 **4 Claims**

Disclosed is an improved battery cell having a molten alkali metal anode and a molten alkali metal polysulfide catholyte separated by a silicate glass as an alkali metal ion permeable membrane. The improvement involves the use of an alkali metal polysulfide having a low hydroxide content as the catholyte. Use of such a material substantially increases the membrane life.

3,663,295

STORAGE BATTERY ELECTROLYTE

Bernard S. Baker, Chicago, Ill., assignor to Institute of Gas Technology

Filed May 14, 1969, Ser. No. 824,707

Int. Cl. H01m *9/00*

U.S. Cl. 136—6 **9 Claims**

An improved electrolyte phase for use in high temperature primary and secondary batteries of the thermally or electrically regenerative type. The improved electrolyte phase is made up of a support matrix, which is solid or paste-like at the operating conditions for the battery, and the electrolyte for the battery immobilized and incorporated in the support matrix. The support matrix is made up of an inert alkali metal salt such as alkali metal aluminate. The electrolyte may be an alkali metal halide or mixtures of alkali metal halides.

3,663,296

METHOD FOR REMOVAL OF RESIDUAL NITRATE FROM NEGATIVE BATTERY PLATES

Torbjorn Nervik, Selbu, Norway, assignor to ESB Incorporated

Filed Aug. 26, 1970, Ser. No. 67,264
Int. Cl. H01m 43/04
U.S. Cl. 136—24 1 Claim

A process is described for the removal of residual nitrate from battery plaques impregnated with cadmium hydroxide by thermal decomposition of the nitrate after the normal impregnation processing is completed.

3,663,297

PROCESS FOR THE PREPARATION OF SINTERED ZINC POWDER BATTERY ELECTRODES

Richard D. Weller, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 24, 1970, Ser. No. 49,548
Int. Cl. H01m 41/00
U.S. Cl. 136—30 9 Claims

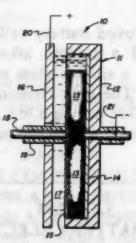
Sintered zinc powder battery electrodes are prepared by (1) rinsing zinc powder with a solvent that dissolves zinc oxide at a faster rate than it dissolves zinc and which is saturated with a water soluble salt having a higher melting point than zinc; (2) pouring off the solvent; (3) mixing the zinc with the water soluble salt used in step (1); (4) packing the mixture around a metal screen that is made of a metal which is an electrical conductor having a higher melting point than zinc; (5) heating the packed article at a temperature above 419° C but below the melting point of the water soluble salt and the metal screen; (6) cooling the article; and, (7) soaking the article in water to remove the water soluble salt.

3,663,298

ROTATABLE ELECTRODE STRUCTURE WITH CONDUCTIVE PARTICLE BED

Lowell R. McCoy, Woodland Hills, and Laszlo A. Heredy, Canoga Park, both of Calif., assignors to North American Rockwell Corporation

Filed Mar. 3, 1970, Ser. No. 16,203
Int. Cl. H01m 43/02; B01k 3/02
U.S. Cl. 136—31 9 Claims



An electrode structure for use with an electrolyte wherein an electrically conductive flowing particle bed stream within a compartment of the electrode structure establishes a plurality of electrochemical reaction sites at the interface of the particles and of the electrolyte.

The flowing particle bed electrode structure finds a preferred application as an electrode in an electrically regenerable system, particularly as a rotatable zinc electrode in zinc-nickel oxide and zinc-air secondary cells.

3,663,299

SOLID STATE ELECTRIC CELL HAVING STABILIZED RESISTANCE

Boone B. Owens, Calabasas, and James E. Oxley, Hollywood, both of Calif., assignors to Gould Sonics, Inc.

Filed Aug. 31, 1970, Ser. No. 68,325
Int. Cl. H01m 11/00, 13/00
U.S. Cl. 136—83 R 12 Claims

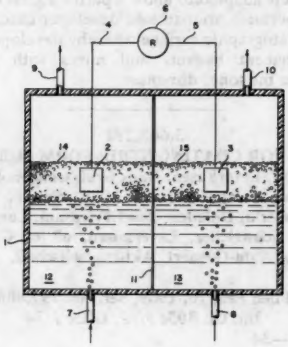
A solid state electric cell having a mobile oxidant such as iodine in the cathode, a solid state electrolyte and a suitable anode containing a reductant material such as silver which is capable of reducing the mobile oxidant, wherein at least the anode additionally contains a material which is capable of reacting with the primary reaction product of the mobile oxidant and reductant to form a resulting product in situ that has improved ionic conductivity as compared to the primary reaction product.

3,663,300

FOAM ELECTROLYTE, FUEL CELL, AND METHOD FOR INCREASING EFFECTIVENESS OF FUEL CELLS

Leonard Nanis, 116 Cornell Avenue, Swarthmore, Pa., and Frank R. McLarnon, 766 Elmwood Avenue, Sharon Hill, Pa.

Filed June 12, 1969, Ser. No. 832,704
Int. Cl. H01m 27/00
U.S. Cl. 136—86 E 10 Claims



The introduction of one or more ingredients of a chemical reaction into a foam atmosphere for the purpose of promoting such reaction. With respect to the application of the present invention to fuel cells, the electrolyte in one or both the anode and cathode cabinets of a fuel cell is modified with the addition of a foaming agent so that the electrodes of the cell are in contact with foamed electrolyte.

3,663,301

LEAK-PROOF PRIMARY CELL

Robert E. Ralston, Spring Valley, and Yung Ling Ko, Peekskill, both of N.Y., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Apr. 9, 1970, Ser. No. 26,943
Int. Cl. H01m 21/00
U.S. Cl. 136—107 7 Claims

A leak-proof electrochemical cell having a cylindrical can closed on its bottom end, and originally open at its top end, with an internal peripheral bead as a seat for a plastic disc to be seated on the bead to cover the elements within the cell, and to receive the crimped end of the can for closure with the plastic disc constructed to have a central co-axial bore and co-axial hub around the bore to hold an anode collector in the shape of a nail whose head supports one of the terminals of the cell, here specifically the negative cap or terminal, welded to said head, and the plastic disc performs the additional function of closing the usual separator, with no in-

tervening structure between it and the separator, to assure greater confining control of the electrolyte in said separator. The plastic disc top also constructed unitarily of full can diameter, and has an annular border disposed to provide a tight seating fit in the can at the bead as a seat, and is held in place by the crimped edge rim of the can to assure a substantially hermetic seal between the disc border and the can. An external metal jacket surrounds and is insulated from the can and has both ends crimped, with the top crimp holding the negative cap terminal to impress an additional pressure force on the metal crimped onto the plastic disc, to assure a hermetic seal under continuous pressure between those engaging surfaces of said plastic disc border and of said crimped metal at the can top.

3,663,302

BELLOW FOR RESERVE CELL

Gordon E. Kaye, 140 North Broadway, Irvington, N.Y.

Filed Aug. 14, 1970, Ser. No. 63,725

Int. Cl. H01m *21/00*

U.S. Cl. 136—114 **6 Claims**

A reserve cell with indefinite shelf life, in which the structural elements, including the anode, cathode, separator and depolarizer are contained in an insulating housing and the electrolyte is contained in a compressible sealed vessel outside the housing and communicating with said housing, so the electrolyte is kept isolated from the cell until the cell is to be activated, at which time the seal is broken to enable the electrolyte to pass from the sealed vessel into the housing to assume operating position between anode and cathode and render the cell active.

3,663,303

PROCESS OF MAKING A GAS DIFFUSION ELECTRODE

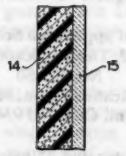
Hermann Dietz, Stuttgart-Giebel, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 16, 1969, Ser. No. 816,761

Claims priority, application Germany, Apr. 17, 1968, P 17 71 179.4

Int. Cl. H01m *13/04*

U.S. Cl. 136—122 **18 Claims**



A porous gas diffusion electrode which is composed of a gas-permeable support and an electrically conductive catalyst layer of electrocatalytically active metal is made by applying the catalyst layer to the support in the form of a pigmented lacquer containing a metal compound forming a precursor of said catalyst, then drying or hardening the lacquer while on the support so as to adhere it thereto and thereafter subjecting the catalyst precursor compound to an activation treatment to convert the compound to the active metal and to provide the necessary porosity to the layer.

The invention also comprises a diffusion electrode which is composed of a gas-permeable, electrolyte-impermeable porous support and a porous lacquer adhered to the support and, finely distributed through said lacquer layer, a conductive material that is resistant to the conditions of operation and an electrocatalytically active metal.

The electrode of the invention is useful in fuel cells or metal-air cells, in particular as a self-breathing hydrophobic gas electrode, for the electrochemical reaction of reactive gases.

3,663,304

IMMOBILIZED ELECTROLYTES FOR SECONDARY CELLS

Frederick Marsh, and Kirk L. Thompson, both of Minneapolis, Minn., assignors to Gould-National Batteries, Inc., St. Paul, Minn.

Filed July 2, 1969, Ser. No. 838,643

Int. Cl. H01m *9/02*

U.S. Cl. 136—157 **16 Claims**

A water activatable heat treated boron phosphate sulphuric acid gel suitable for use as an electrolyte precursor in a lead acid secondary cell.

3,663,305

METHOD OF MANUFACTURING A STORAGE BATTERY

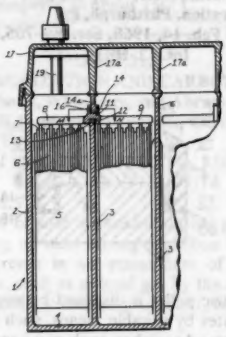
Hans-Georg Lindenberg, Hannover-Stocken, Germany, assignor to Varta Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 21, 1969, Ser. No. 868,035

Claims priority, application Germany, Oct. 24, 1968, P 18 04 800.5

Int. Cl. H01m *5/00*

U.S. Cl. 136—176 **8 Claims**



Method of manufacturing a battery in which the cells are initially interconnected by means of a transverse connecting member and are then confined within a battery casing. The cells are separated from each other by a partition wall in the casing which includes a cutout through which the connecting member extends with clearance. This clearance is injection molded with a plastic material and a cover is subsequently bonded to the top of the battery casing.

3,663,306

HIGH PRESSURE RESISTANT COMPACT HOUSING STRUCTURE

Nicholas Howard Des Champs, Reeds Ferry; Kenneth E. Mayo, Nashua; Douglas Arthur Messier, Hudson, all of N.H., and Ronald William James, Groton, Mass., assignors to Sanders Nuclear Corporation, Nashua, N.H.

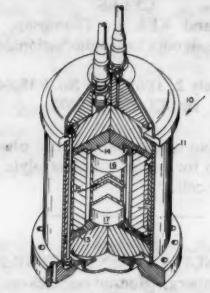
Filed Nov. 6, 1968, Ser. No. 773,782

Int. Cl. G21h *1/10*

U.S. Cl. 136—202 **8 Claims**

A high pressure resistant compact housing structure is provided which is particularly useful in connection with thermoelectric radioisotope generator constructions. The housing is particularly constructed for use at high external pressures as at great depths in the ocean and is resistant to galvanic corrosion and high pressure. An outer housing shell transfers high pressures to interior structure which absorbs substantially the entire pressure load. Preferably a radioisotope heat source is enclosed in the housing. Heat at both ends of the source is utilized to obtain maximized efficiency of the source in thermoelectric conversion. A novel mounting structure for the heat source and associated thermoelectric con-

version means comprises utility mounting plates and associated radiation shielding preferably incorporating a novel



double seal arrangement in accordance with this invention. The construction permits low power-weight ratios in high pressure resistant radioisotope thermoelectric generators.

3,663,307

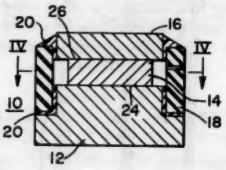
THERMOELECTRIC DEVICE

Cecil J. Mole, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 14, 1968, Ser. No. 705,507

Int. Cl. H01v *1/32*

U.S. Cl. 136—204 **13 Claims**



A thermoelectric pellet is disposed between and attached to two metal plates by suitable means, such as metallurgical bonding. A structural member, such as an annulus composed of an epoxy resin having a characteristic of shrinking when cured, surrounds the pellet and is bonded to the metal plates, thereby sealing it from the atmosphere. The structural member is so arranged that the pellet is maintained under a substantial compression load at all times and the complete structure is both rigid and strong.

3,663,308

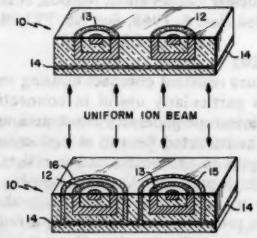
METHOD OF MAKING ION IMPLANTED DIELECTRIC ENCLOSURES

John Edmund Davey, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 5, 1970, Ser. No. 87,027

Int. Cl. H01l *7/54*

U.S. Cl. 148—1.5 **2 Claims**



A method of producing electrical isolation between semiconductor devices diffused in a substrate by ion implantation of various species of gases around the semiconductor devices, forming insulating dielectric cups.

3,663,309

FLAME CUTTING METHOD

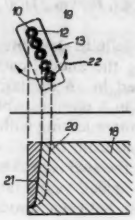
Gerhard Lange, Frankfurt am Main, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany

Continuation of application Ser. No. 765,260, Oct. 4, 1968, now abandoned. This application Sept. 22, 1970, Ser. No. 74,365

Claims priority, application Germany, Oct. 5, 1967, P #16 29 959.5

Int. Cl. B23k *7/00*

U.S. Cl. 148—9 **7 Claims**



A flame cutting torch cuts tulip shaped edges of certain depth with the cutting pressure being adjusted to the cutting depth and reduced by more than 50 percent and with the torch nozzle heated unilaterally at the side disposed toward the work piece.

3,663,310

METHOD OF PRODUCING DEEP DRAWING STEEL

Toshio Shiraiwa, Nara-Ken, and Fukunaga Terasaki, Osaka, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Continuation-in-part of application Ser. No. 18,350, Mar. 10, 1970, now abandoned. This application Nov. 17, 1970, Ser. No. 90,450

Claims priority, application Japan, Mar. 13, 1969, 44/19409

Int. Cl. C21d *9/48*

U.S. Cl. 148—12 **5 Claims**

A ferrous material capable of extremely deep drawing is obtained from rimmed carbon steel containing not more than 0.10 percent C by hot rolling at a finishing temperature of at least 800° C., rapid quenching to less than 500° C., slow further cooling to permit cementite precipitation, cold rolling, and recrystallizing by annealing at 650° to 800° C., the annealing temperature being reached at a heating rate of less than 100° C./hr.

3,663,311

PROCESSING OF COPPER ALLOYS

Gilbert Y. Chin, Murray Hill, and Robert R. Hart, Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

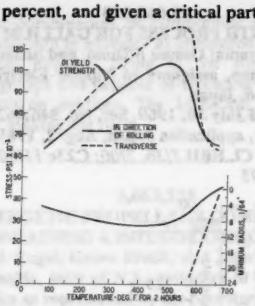
Continuation-in-part of application Ser. No. 802,438, Feb. 26, 1969, now abandoned. This application May 21, 1969, Ser. No. 826,468

Int. Cl. C22f *1/08*

U.S. Cl. 148—11.5 R **6 Claims**

Phosphor-bronze, nickel-silver, beryllium-copper, and cupro-nickel alloys, when cold worked to an area reduction

of at least 65 percent, and given a critical partial terminal anneal, exhibit higher yield strengths for given amounts of formability than have heretofore been attained.



3,663,312

NITRIDE-STRENGTHENED, STAINLESS STEEL

Lynn E. Kindlimann, Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Mar. 9, 1970, Ser. No. 17,487
Int. Cl. C21d 7/00; C22c 39/20, 41/02
U.S. Cl. 148—12 25 Claims

An article comprising at least one layer which consists essentially of a nitride-strengthened, austenitic stainless steel. The steel contains as a dispersoid therein particles of metal nitride having a free energy of formation of greater than than about 10 microns and has a microstructure comprised of elongated primary grains which contain twins and sub-grains; wherein a substantial number of said primary grains are greater than 20 microns wide and substantially longer than 40 microns.

A method of forming a nitride-strengthened, austenitic stainless steel having a microstructure comprised of elongated primary grains which contain twins and sub-grains; wherein a substantial number of said primary grains are greater than 20 microns wide and substantially longer than 40 microns. It comprises the steps of: providing a nitride-strengthened, austenitic stainless steel which contains as a dispersoid therein particles of metal nitride having a free energy of formation of greater than −21,000 cal./mole, present at an interparticle spacing of less than about 10 microns; warm working the steel at a temperature below its recrystallization temperature; and annealing the steel at a temperature at or in excess of its germination temperature.

3,663,313

WELDING FLUX COMPOSITION

James E. Oberly, Kearny; Thomas L. Coless, Maplewood, and K. Woodrow Rimer, Plainfield, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 15, 1970, Ser. No. 46,529
Int. Cl. B23k 35/38
U.S. Cl. 148—23 2 Claims

A bonded welding composition or flux for welding or surfacing of metals which is free-peeling, essentially non-hygroscopic. The composition contains calcium carbonate as its major ingredient together with a sodium or potassium silicate binder. The flux is rendered non-hygroscopic by heating the ingredients to a temperature in the range of 1,450° F. to about 1,800° F.

3,663,314

BEARING STEEL COMPOSITION

Kaizo Monma, 164 Toori-cho, Sendai-shi, Miyagi-ken, and Toshiro Yamamoto, 60-121 Kitahirai, Kagiya, Yokosuka-cho, Chita-gun, Aichi-ken, both of Japan

Continuation-in-part of application Ser. No. 691,868, Dec. 19, 1967, now abandoned. This application Oct. 14, 1970, Ser. No. 80,646
Int. Cl. C21d 1/00; C22c 39/14
U.S. Cl. 148—36 3 Claims

A bearing steel consisting of 0.55 to 0.78 percent of carbon, 0.50 to 2.00 percent of chromium, 0.10 to 1.15 percent of manganese and 1.00 to 2.00 percent of silicon by weight with the balance iron, said steel having been spheroidized during annealing, and afterward, heated to an austenitizing temperature ranging from about 810° to 870° C. for a period of about 30 minutes to dissolve 0.35 to 0.55 percent by weight of carbon into austenite retaining 3 to 6 percent by weight of undissolved spheroidized iron carbide, liquid quenched and tempered at about 150° C.

3,663,315

GAS CARBURIZATION AND CARBONITRIDING

Maurice F. Hoffman, Whippany, and Abram L. Hodge, Cranford, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 26, 1969, Ser. No. 810,805
Int. Cl. C23c 11/12, 11/18
U.S. Cl. 148—16.5 10 Claims

The formation of soot is avoided during gas carburization or carbonitriding of steel having a carbon content of from 0.10 – 0.40 percent in an atmosphere of nitrogen and a hydrocarbon gas, such as natrual gas by the use of a barium, calcium or strontium containing inhibitor, for example, barium hydroxide.

3,663,316

STEEL FOR SAW BLADES

Alfred Kulmburg, Kapfenberg, Austria, assignor to Gebr. Bohler & Co. Aktiengesellschaft, Kapfenberg, Austria

Filed Dec. 30, 1970, Ser. No. 102,913
Claims priority, application Austria, Jan. 9, 1970, A162/70
Int. Cl. C21d 9/24; C22c 39/20; B23p 15/28
U.S. Cl. 148—36 3 Claims

A sawblade consisting essentially of 0.6–0.9% C, 0.5–1.0% Si, 0.4–1.0% Mn, 0.4–1.0% Cr, 0.2–0.8% Mo, 0.3–1.0% Ni, at least one element in an amount of up to 0.3% selected from the group consisting of Ti or V, remainder iron and residual impurities; the microstructure of the sawblade being bainitic which has been hardened to a hardness range of 46–54 HR_c.

3,663,317

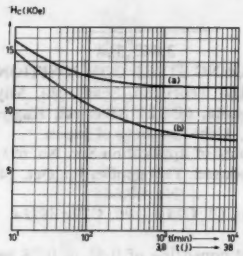
METHOD OF MAKING A PERMANENT-MAGNETISABLE BODY OF COMPRESSED FINE PARTICLES OF A COMPOUND OF M AND R

Frans Frederik Westendorp, and Antonius Gregorius Rijnbeek, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 18, 1970, Ser. No. 90,512
Claims priority, application Netherlands, Dec. 20, 1969, 6919154
Int. Cl. H01f 7/06
U.S. Cl. 148—103 1 Claim

A method of manufacturing a permanent magnet from compressed M_5R powder (M is, for example, Co, R is a rare

earth or Th). The powder is obtained by grinding castings in oxygen- and water-free environments in an inert gas or an



inert liquid. The resultant magnet exhibits a small ageing effect, while in addition magnets of higher density can be obtained.

3,663,318

PROCESS FOR MAKING FERROMAGNETIC METAL POWDERS

Ernest L. Little, Jr., and Jack D. Wolf, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 5, 1970, Ser. No. 78,182
Int. Cl. H01f 1/06, 1/20; C22b 23/04
U.S. Cl. 148—105 **12 Claims**

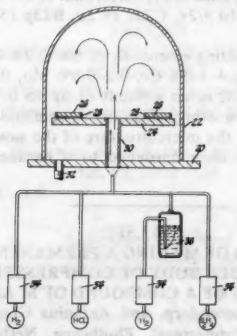
Disclosed herein is a process for making ferromagnetic powders from salts of iron, cobalt, nickel, and from 0 to 35 percent of a chromium salt, by total weight of the salts. The process comprises reacting the metal salt or salts with a reducing agent of (a) an amine-borane and (b) a tetrahydroborate.

3,663,319

MASKING TO PREVENT AUTODOPING OF EPITAXIAL DEPOSITS

John W. Rose, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1968, Ser. No. 777,368
Int. Cl. H01l 7/36
U.S. Cl. 148—175 **3 Claims**



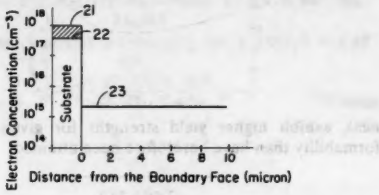
A technique is disclosed for producing extremely high resistivity epitaxial deposits, particularly of P-type conductivity on low resistivity substrates. P-type epitaxial deposits of up to 50 ohm-centimeters on a 0.01 ohm-centimeter P-type substrate can be obtained by masking the back and sides of the epitaxial substrate, leaving exposed only the surface on which the epitaxial deposit is formed.

3,663,320

VAPOR GROWTH PROCESS FOR GALLIUM ARSENIDE

Mitsuhiro Maruyama; Osamu Mizuno, and Sadao Kikuchi, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed July 30, 1969, Ser. No. 846,062
Claims priority, application Japan, Aug. 2, 1968, 43/55672
Int. Cl. H01l 7/36, 7/00; C23c 11/00
U.S. Cl. 148—175 **4 Claims**



A process is provided for vapor growing a gallium arsenide single crystal layer on a substrate seed-crystal of gallium arsenide having a uniform electron concentration profile in the layer wherein at least two kinds of impurities of the same conductivity type are employed, one which causes autodoping to occur in the vapor-grown crystal, the other which tends to inhibit autodoping.

3,663,321

ALLOY DIODE CHARACTERISTICS CONTROL METHOD

King Lau Hu, Torrance, Calif., assignor to TRW, Inc., Lawndale, Calif.

Filed Nov. 14, 1969, Ser. No. 876,748
Int. Cl. H01l 7/34
U.S. Cl. 148—181 **16 Claims**

A method for controlling the electrical characteristics of alloy diodes by subjecting the diode to a series of at least two carefully controlled reheat steps in order to result in predictable electrical characteristics for the diode. The first heat step involves heating the diode, after the PN junction has been formed and the device has been brought to room temperature, to a predetermined temperature of from 800° C. to 1,100° C. for from 15 seconds to 1 hour; thereafter and while the device is still at the predetermined temperature, the temperature is varied one or more times by a predetermined amount ΔT. ΔT is in the range from ¼° C. to 30° C.

3,663,322

HYPERGOLIC SOLID FUELS OF HIGH STORAGE STABILITY FOR HYBRID ROCKET ENGINES AND PROCESS FOR MAKING THE SAME

Paula Sarten, Munich, and Winfried Mair, Riemerling, both of Germany, assignors to Messerschmitt-Bolkow, Gesellschaft mit beschrankter Haftung, Ottobrunn near Munich, Germany

Filed Jan. 16, 1969, Ser. No. 791,803
Claims priority, application Germany, Jan. 20, 1968, P 16 46 310.8
Int. Cl. C06d 5/10
U.S. Cl. 149—19 **11 Claims**

A hypergolic solid fuel of high storage stability for hybrid rocket engines, comprising incorporated in a small amount of

a binder a combination of compounds extremely rich in hydrogen and rich in nitrogen as compared to the contents in carbon, said nitrogen being in the form of cyano- or hydrazine groups and capable of releasing high energy upon contact with an oxidizer. The invention also relates to a process for making the fuels.

3,663,323

ENERGETIC PROPELLANT COMPOSITION CONTAINING A DIFLUORAMINO BINDER

Lawrence J. Engel, Green Brook, and John Brooke Gardiner, Mountainside, both of N.J., assignors to The United States of America as represented by the Secretary of the Army

Continuation-in-part of application Ser. No. 671,164, Sept. 27, 1967, now abandoned. This application Apr. 30, 1970, Ser. No. 43,618

Int. Cl. C06b *11/00*

U.S. Cl. 149—19 **4 Claims**

An improved energetic propellant charge, of the solid type useful in rockets and rocket motors, may be formulated with a system of the polymer of tetrakis(difluoramino)amyl acrylate and a large amount of hexakis(difluoramino)propyl ether if trimethylolpropane trimethacrylate and a peroxidic polymerization catalyst such as dichlorobenzoyl peroxide are used to crosslink the tetrakis(difluoramino)amyl acrylate from which the polymer is derived.

3,663,324

LIQUID EXPLOSIVE CONTAINING A NITRAMINE EXPLOSIVE DISSOLVED IN A NITROPARAFFIN

Leonard N. Roberts, Scottsdale, Ariz., assignor to Talley Frac Corporation, Pryor, Okla.

Filed Oct. 27, 1969, Ser. No. 869,883

Int. Cl. C06b *7/00*

U.S. Cl. 149—90 **10 Claims**

A liquid explosive is described which has a small critical diameter, is safe to handle, is capable of use in cold climates and yet is compatible with the higher temperatures commonly present in subterranean formations, which includes a nitroparaffin compound having dissolved therein a nitramine explosive, a ballistic modifier and a detonation aid in such proportions that the critical diameter of the explosive is on the order of one thirty-second inch. Other constituents may also be added for controlling the consistency and ballistic properties as well as the manufacturing and handling properties of the explosive. A thickening or gelling agent is also preferably added to retain the ballistic modifier as well as any other suspended solids in a uniform dispersion. A method of fracturing well formations for enhancing their productivity, using such liquid explosives, is described.

3,663,325

SURFACE TREATING METHOD FOR MOLDINGS OF POLYSTYRENE TYPE RESINS

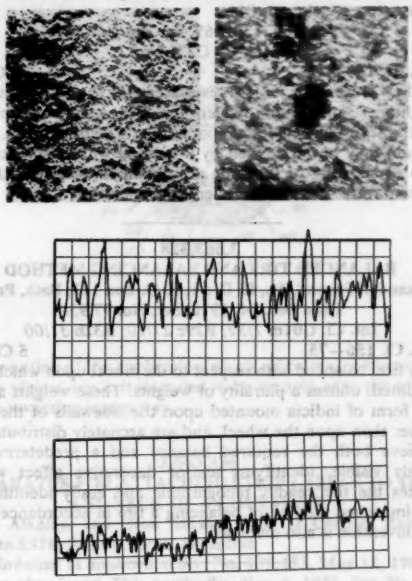
Kiminori Uda, Yokohama; Hiroya Yamamoto, Tokyo; Naoatu Kasuga, Fujisawa, and Kenzi Fuziyoshi, Yokohama, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed June 11, 1970, Ser. No. 45,337

Int. Cl. C23c *1/00*

U.S. Cl. 156—2 **12 Claims**

A surface treating method for moldings of polystyrene type resins wherein there is dispersed in water a solvent selected from the group consisting of aromatic hydrocarbons, chlorinated hydrocarbons, cycloaliphatic hydrocarbons, ketones and esters using a surface active agent to form an aqueous emulsion containing 0.2 to 30 percent by weight of the solvent; the aqueous emulsion is brought into contact with moldings of polystyrene type resin for treatment of their surfaces; the treated surface of the moldings is further chemically etched using a mixed solution of sulfuric acid and



dichromic acid; and, if required, the surface is again treated by heated concentrated sulfuric acid.

3,663,326

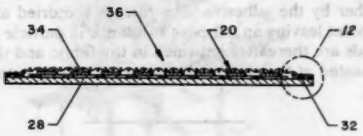
ARTICLE HOLDING METHODS AND ASSEMBLAGE

William R. Wanesky, Wescosville, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 9, 1970, Ser. No. 1,800

Int. Cl. B32b *31/14*; C23f *1/00*

U.S. Cl. 156—3 **12 Claims**



Methods involve holding an array of semiconductor devices on a substrate by means of a polyester mesh screen and photoresist material. After the array of devices have been formed by photoresist and etch techniques from a slice waxed to the substrate, the photoresist material is removed from the array but not from the substrate surrounding the array. The polyester mesh screen is placed over and forced against the array and photoresist material while the wax is removed with a solvent. The solvent softens the photoresist material so that the forced screen embeds in the photoresist. Upon removal from the influence of the solvent, the photoresist material rehardens fastening the screen to the substrate with the devices retained between the screen and the substrate in their original orientation and array. The assemblage of substrate, photoresist material and screen permits the devices, no longer waxed to the substrate, to be transported to other operations where the screen is peeled off and the devices removed.

3,663,327

FORMULATION AND METHOD FOR BRIGHTENING ALUMINUM

Jack Henry Ritzi, Cincinnati, Ohio, assignor to Chemed Corporation, Cincinnati, Ohio

Filed Aug. 13, 1969, Ser. No. 849,906
Int. Cl. C23f 3/02
U.S. Cl. 156—21 1 Claim

The present invention is directed to an aluminum brightener formulation which includes water, phosphoric acid, a transition metal compound and a wetting agent. Aluminum may be brightened by a method which includes the step of spraying or brushing an aluminum surface with the present formulation at a moderate temperature.

3,663,328

BALANCED TIRE AND BALANCING METHOD

Alexander Turoczi, Jr., R. D. #1, P. O. Box 113, Bath, Pa.

Filed Dec. 14, 1970, Ser. No. 97,938
Int. Cl. G01m 1/32; B29c 27/10; B32b 31/00
U.S. Cl. 156—75 5 Claims

A tire, balanced with respect to the wheel upon which it is mounted, utilizes a plurality of weights. These weights are in the form of indicia mounted upon the sidewalls of the tire, rather than upon the wheel, and are arcuately distributed to achieve both the required balance and a predetermined, highly visible, identifying and/or decorative effect which makes the tire readily recognizable and easily identifiable. An improved method of balancing a tire in accordance with the invention is also disclosed.

3,663,329

METHOD OF REINFORCING A KNITTED OR WOVEN FABRIC

Rudolf H. Rossmann, Gauting near Munich, Germany, assignor to U.T.I., Inc., Scranton, Pa.

Continuation of application Ser. No. 781,694, Nov. 29, 1968, now abandoned, which is a continuation of application Ser. No. 408,620, Nov. 3, 1963, now abandoned. This application July 15, 1970, Ser. No. 56,223
Claims priority, application Germany, Nov. 5, 1963, Sch 34118
Int. Cl. B32b
U.S. Cl. 156—148 7 Claims

A method of reinforcing woven or knitted fabric of a plurality of threads in which an adhesive having a liquid vehicle is applied to selected threads and the threads are joined together by the adhesive. The threads are dried at the contact point leaving an adhesive substance in particle form. The threads are thereafter entwined in the fabric and the threads are heated at the points where the adhesive substance is applied.

3,663,330

METHOD AND APPARATUS FOR MAKING BIAS-LAID PRODUCTS

Karl E. Sager, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 31, 1970, Ser. No. 24,216
Int. Cl. B65h 81/04
U.S. Cl. 156—190 11 Claims

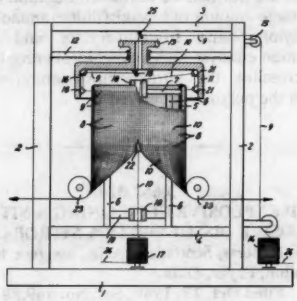
Apparatus and method for making a multi-ply web product having at least two plies at different angles with respect to the web. An endless belt is looped helically around a cylindrical mandrel; an optional first ply is laid longitudinally along the belt. As the belt moves a second ply is wrapped helically around the first helix but at a different angle. A third ply is also wrapped around the mandrel, belt, and first ply, and this is at an angle different from the second ply. Finally, the second and third plies are cut by slitting along the edge of the belt.

3,663,331

METHOD AND APPARATUS FOR MANUFACTURING NET MATERIAL AND OTHER NON-WOVEN FABRICS

Erik Solbeck, Vedbaek Strandvej 342, 2950 Vedbaek, Denmark

Filed June 18, 1970, Ser. No. 47,533
Claims priority, application Denmark, Oct. 8, 1969, 5356/69
Int. Cl. D04h 3/12
U.S. Cl. 156—181 6 Claims



An apparatus for producing and subsequently longitudinal slitting of a hose-like fabric consisting of a plurality of parallel warp threads and two continuous weft threads intersecting the warp threads and bonded thereto at points of intersection, comprises means for advancing the warp threads in the form of a hollow-cylindrical thread layer, and means for advancing a weft thread from each of two stationary weft thread supplies to a respective one of two weft thread guides rotating on a common axis parallel to the axis of the warp thread layer, the weft thread advancing means being arranged so that the weft threads enter the respective thread guides from axially opposite ends of the hollow warp thread layer.

3,663,332

METHOD OF FORMING A GASKET

George E. Gard, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Original application Aug. 30, 1966, Ser. No. 576,017, now Patent No. 3,492,011. Divided and this application Jan. 27, 1970, Ser. No. 10,100
Int. Cl. B29d 23/10
U.S. Cl. 156—217 5 Claims

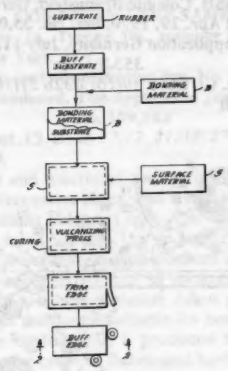
The invention relates to a method of forming resilient gaskets. A resilient elongated rectangular bonded particulate material sheet having a thickness equal to the width of the desired gaskets is formed into a loop and the ends bonded in an abutting relationship. The looped sheet is sized and shaped in a mold under heat and pressure to form a sleeve having a sectional shape and dimensions of the desired gasket. The molded sleeve is then cut transversely to form a plurality of gaskets.

3,663,333

METHOD OF BONDING MATERIAL HAVING A LOW COEFFICIENT OF FRICTION TO A SUBSTRATE

Donald H. Palfreyman, Dedham, Mass., assignor to Fabreeka Products Company, Boston, Mass.

Filed July 18, 1969, Ser. No. 843,086
Int. Cl. B32b 31/12
U.S. Cl. 156—256 5 Claims



Method of bonding sheet material having a very low coefficient of friction to a substrate such as rubber, felt or the like, which comprises providing, as an uncured bonding material, cotton textile fabric impregnated with a thermosetting general purpose phenolic resin; buffing the surface of the substrate; placing thereon a ply of the uncured bonding material; placing the low-coefficient material upon the bonding layer and then vulcanizing the assembly.

3,663,334

LAMINATING METAL TO POLYOLEFIN WITH AN ORGANIC PEROXIDE AND A TERPOLYMER OF ETHYLENE, T-BUTYL ACRYLATE AND ACRYLIC ACID

Heinz Mueller-Tamm, Ludwigshafen, and Alfred Hofmann, Roxheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed May 19, 1969, Ser. No. 825,978
Claims priority, application Germany, May 22, 1968, P 17 69 422.3
Int. Cl. C09j 3/14, 5/06, 7/00
U.S. Cl. 156—309 3 Claims

A process for bonding or laminating materials by means of terpolymers of ethylene, an ethylenically unsaturated carboxylic acid and an ester of an ethylenically unsaturated carboxylic acid. It is a characteristic of the process that the terpolymers are used with an addition of an organic peroxide having the general formula $R^1—O—O—R^2$ or $R^1—O—O—X—O—O—R^2$ in which R^1 and R^2 denote hydrogen atoms or alkyl, aryl, aralkyl, alkaryl or acyl radicals and X denotes an aliphatic, aromatic, aromatic-aliphatic or aliphatic-aromatic radical.

3,663,335

INSULATED HEAT PACKS

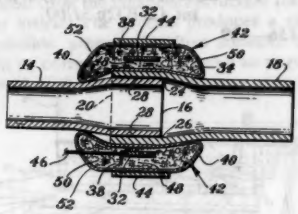
Richard E. Sheedy, Huntington Sta., N.Y., assignor to Fiberglass Resources Corp., Farmingdale, N.Y.

Filed Nov. 20, 1969, Ser. No. 878,453
Int. Cl. B29c 27/06; B23k 31/00
U.S. Cl. 156—380 2 Claims

A heat source assembly for use in adhesively joining together thermosetting resin impregnated members.

A heat source consisting of a combustible material is enclosed in a non-combustible insulation which moderates the flow of heat to the joint area and also prevents rapid cooling to maintain uniform heating temperatures.

The aforementioned abstract is neither intended to define



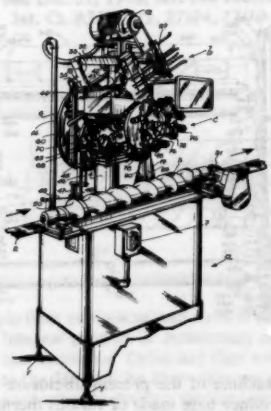
the invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,663,336

APPARATUS FOR ATTACHING STRIP LABELS TO TOP AND NECK OF A CONTAINER

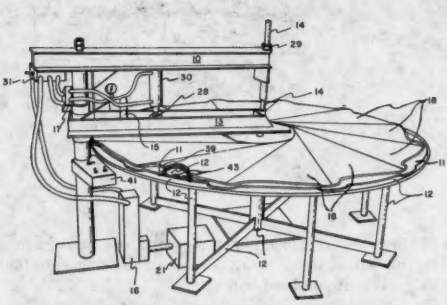
Jorge Alkalay, and Oton Alkalay, both of Coronel Ramon Lista 5376, Buenos Aires, Argentina

Continuation of application Ser. No. 639,453, May 18, 1967, now abandoned. This application Nov. 6, 1970, Ser. No. 87,646
Int. Cl. B65c 3/12, 3/06
U.S. Cl. 156—485 18 Claims



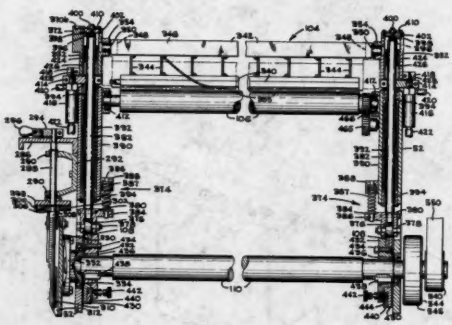
A labeling machine for affixing revenue stamps across the top and down the sides of the neck of a bottle. As bottles continuously are moved along a conveyor, the revenue stamps are placed, adhesive side down, on the bottle top by a clamp. Two rollers simultaneously move down the neck of the bottle and press the stamp securely thereon. The rollers then separate and move off of the bottle neck. Multiple pairs of rollers are on a continuous chain which moves with the speed of the conveyor so that the stamps may be affixed on multiple bottles as the bottles move with the conveyor belt.

3,663,337
METHOD AND APPARATUS FOR MAKING SPIRAL-REEFED PARACHUTES
Stanley C. Hulteen, Chancellor, S. Dak., assignor to The United States of America as represented by the Secretary of the Army
Filed Sept. 2, 1970, Ser. No. 69,075
Int. Cl. B32b 31/00
U.S. Cl. 156—499 7 Claims



A machine assembly for the fabrication of spiral reefed parachutes includes a main turntable, an overhead operated press plate to seal the gore canopy sections, a heating element in the press plate, a manifold to speed up cooling and a jig to attach eyelets to the canopy.

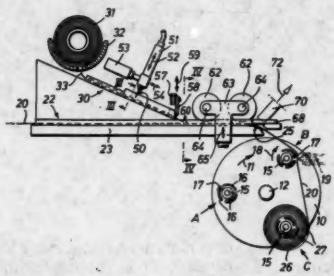
3,663,338
BAG MACHINE
Robert J. Wech, Green Bay, Wis., assignor to FMC Corporation
Filed Sept. 16, 1968, Ser. No. 760,048
Int. Cl. B32b 31/18, 31/20
U.S. Cl. 156—515 8 Claims



The bag machine of the present disclosure is of the type which can produce bags made of various thermoplastic sheet material and can be adapted to make side weld or bottom weld bags. The following description will, however, be confined to the production of side weld bags.

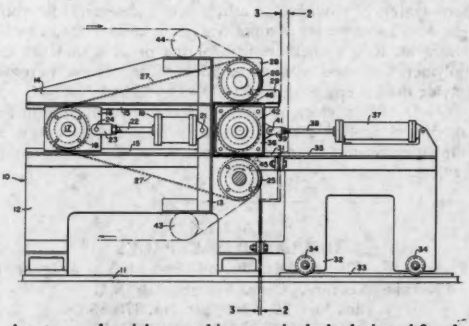
A roll of plastic web is mounted on an unwind stand and traverses a folding board constraining the web to fold along its longitudinal median or along a line spaced from and parallel to the longitudinal median in the event it is desired to produce wicketed bags having lip with a pair of holes in which is inserted a U-shape wire called a wicket. Upstream of the folding board a gusseter is provided to produce a fold which permits greater expansion at the bottom of the bag. The folded and gusseted web thence comes under the influence of a reciprocating transversely disposed seal and cutter bar which divides the web, at longitudinally spaced intervals, to produce individual bags. The bags are then transported to a table which is provided with devices for arranging the bags into a stack.

3,663,339
METHOD AND APPARATUS FOR SECURING SUPERIMPOSED WINDINGS OF A COIL
Helmut Herrmann, Cologne-Braunsfeld, Germany, assignor to Metalloxyd GmbH, Cologne-Braunsfeld, Germany
Filed Apr. 29, 1970, Ser. No. 33,000
Claims priority, application Germany, July 11, 1969, P 19 35 353.8
Int. Cl. B65h 39/16; B32b 31/10
U.S. Cl. 156—540 12 Claims



A method and apparatus for adhesively securing two windings at the beginning and end of a wound up band by a tape adhesive on both sides. The tape adheres to a lateral strip portion of a carrier web, which is supplied to the wound up band, and then also adheres to the same. The other lateral strip portion is folded over so that the carrier web becomes stiff. The tape is peeled off the stiff folded carrier web when bent with the wound up band about an edge.

3,663,340
APPARATUS FOR PRODUCTION OF TEXTILE, LETTER PRESS AND PRINTING BLANKETS
William C. Ross, Winchester, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.
Filed June 24, 1970, Ser. No. 49,227
Int. Cl. B31f 5/00; B30b 3/00
U.S. Cl. 156—555 4 Claims



A rotary vulcanizing machine, particularly designed for the production of textile, letter-press and screen-print blankets. The compression belt, a glass cord reinforced rubber blanket, operates over small diameter (12 inches) rolls, and is tensioned by the thrust of hydraulic cylinders. The heated curing roll can be withdrawn from the machine and slid onto a

wheeled carriage to move out of the way while a blanket to be cured is being dressed on the machine. The high strength of the compacting belt and its flexiblity while producing the same amount of compacting pressure eliminates the necessity of large diameter curing rolls for stainless steel belts saving cost, size, weight and floor space.

3,663,341

THREE SHEET OVERLAY AND LAMINATES COMPRISING THE SAME

Lee E. Veneziale, Jr., Tyrone, Pa., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 45,933, June 12, 1970, now abandoned. This application Jan. 25, 1971, Ser. No. 109,563

Int. Cl. B32b *17/12, 21/08, 27/36*

U.S. Cl. 161—6 **13 Claims**

A decorative and functional overlay comprising a sheet of glass fibers, a decorative sheet, and a shock-absorbing sheet, all sheets containing polyester resin. The sheets may be layed up with and fused directly to a rigidity-imparting base member or the sheets may be consolidated into a thin unitary panel not exceeding 0.030 inch in thickness which may be bonded or glued to a core material. A low pressure laminate with high impact resistance, suitable for horizontal as well as vertical surface applications, is produced by laminating the sheets in particular order to flakeboard having a density of at least about 46 pounds per cubic foot.

3,663,342

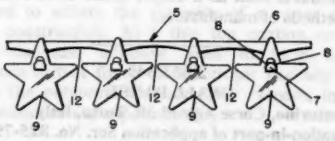
CHRISTMAS TREE GARLANDS OF FLEXIBLE STRIP MATERIAL WITH ATTACHED STAR ELEMENTS AND METHOD OF ASSEMBLY

Bernhard R. Landwehr, 390 Whitewood Road, Union, N.J.

Filed Dec. 30, 1969, Ser. No. 889,153

Int. Cl. A47g *33/08*

U.S. Cl. 161—14 **3 Claims**



This invention consists of a strip of thin flexible foil-like material having a silver, gold, or any other desired finish. The aforesaid strip of material is provided with a plurality of spaced members extending at right angle to the strip of material, each member having a recess in each longitudinal edge thereof; and a plurality of stars or other configurated members having an opening therein for the reception of the aforesaid members. The members are adapted to hold the stars or other configurations on the aforesaid strip of material which is then placed on the Christmas tree or the like as a decoration.

3,663,343

COMPOSITE PRESSURE SENSITIVE ADHESIVE SHEET STRUCTURE AND PROCESS OF MAKING THE SAME

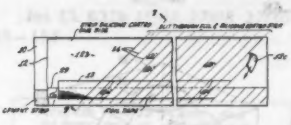
Homer G. Buck, Los Angeles, Calif., assignor to By-Buk Company

Filed May 11, 1970, Ser. No. 36,209

Int. Cl. B32b *3/16, 7/06*

U.S. Cl. 161—39 **16 Claims**

A process in which a carrier strip has a release coated web marginally secured thereto, the latter releasably adherently mounting a longitudinally extending tape having a pressure sensitive adhesive on its underside. The release coated strip is longitudinally severed with the line of severance being spanned by the adhesive coated tape. Subsequently, the combined span of the tape and a marginal portion of the release coated stock that is freely superposed on the carrier strip, are transversely slit defining a plurality of discrete pressure sensitive adhesive backed sections of tape, each provided with a corresponding tab by means of which each discrete section of tape can be peeled from the composite structure for application to another article. The process produces a roll of individually dispensible, pressure sensitive adhesive tape sections, each with its corresponding tab being so angularly related to the length of the composite structure as to facilitate



winding up of the product, in the process of manufacture, to protectively enclose the tabs between successive coils of the carrier strip. Upon unwinding of the roll through a specially adapted guide means of a dispensing apparatus, each tab is individually projected out of the plane of the carrier strip to provide clearance for grasping a free end of the tab stripping the associated adhesive backed sheet article from the roll. The carrier strip and tape may have different characteristics of light reflectivity, controlling an automatic feed system for the dispensing apparatus, cooperatively associated with a photoelectric light cell or the like.

3,663,344

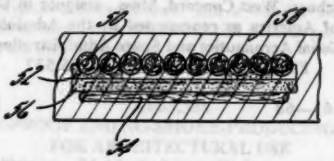
ORTHOTROPIC FIBER-REINFORCED THERMOPLASTIC FILM AND METHOD OF MANUFACTURE

Robert J. Brock, Appleton, and Paul B. Hansen, Neenah, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 31, 1970, Ser. No. 103,150

Int. Cl. B32b *5/12, 27/04, 27/12*

U.S. Cl. 161—59 **8 Claims**



A film-staple fiber composite, and method of making same, provides an integral product of satisfactory tensile strength yet with low tear resistance. Cross-laid fiber webs impart tensile strength to the film and the fiber webs are placed in close proximity to each other to develop the low tear resistance.

3,663,345

FIRE RETARDANT CARPET

Gul G. Jaisinghani, Bell, Calif., assignor to National Acceptance Company of California, Beverly Hills, Calif.

Filed Mar. 2, 1970, Ser. No. 15,677

Int. Cl. B32b *7/04*

U.S. Cl. 161—64 **1 Claim**

A carpet in which the pile fibers are fixed to the primary backing by a compound comprising a latex binding material combined with an aluminum hydrate. The compound may be placed on the primary backing with sufficient thickness so that when the secondary backing is applied, no air pockets

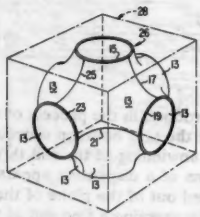
exist between the backings. Pressure rollers and/or a wetting or dispersion agent may be used to ensure that the primary backing is permeated by the compound.

3,663,346

HONEYCOMB CORE STRUCTURES OF MINIMAL SURFACE TUBULE SECTIONS

Alan H. Schoen, West Concord, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed July 22, 1970, Ser. No. 57,253
Int. Cl. B32b *3/12*
U.S. Cl. 161—68 **16 Claims**



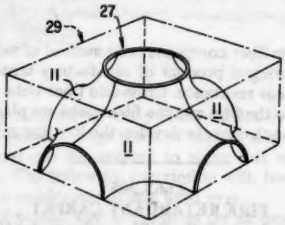
Honeycomb cores formed of tubule sections bounded orthogonally by plane facings are described. The tubule sections are defined as being formed of minimal surface elements that orthogonally intersect all of the surfaces of an imaginary kaleidoscopic cell at least once. In other words, the tubule sections are broken into elements for definition purposes. The elements are defined as minimal surface elements, i.e., elements that have a mean curvature that is equal to zero at all points on their surface. These elements are further defined inside of an imaginary kaleidoscopic cell in that they orthogonally intersect all surfaces of an imaginary kaleidoscopic cell at least once. Moreover, the tubule sections are smoothly interconnected to form honeycomb core structures that have no internal discontinuities.

3,663,347

HONEYCOMB PANELS FORMED OF MINIMAL SURFACE PERIODIC TUBULE LAYERS

Alan H. Schoen, West Concord, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed July 16, 1970, Ser. No. 55,537
Int. Cl. B32b *3/12*
U.S. Cl. 161—68 **17 Claims**



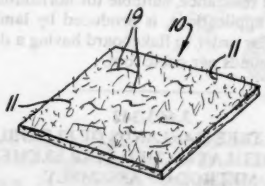
Panels including honeycomb cores formed of minimal surface periodic tubule layers are described. Each tubule layer is defined as being formed of minimal surface elements that orthogonally intersect all of the faces of a kaleidoscopic cell at least once. In other words, for purposes of definition, the tubule layers are broken into elemental sections. The elemental sections are defined as minimal surface elements, i.e., elements having a mean curvature at all points on the surface that is equal to zero. These elements are further defined inside of kaleidoscopic cells wherein they orthogonally intersect all faces of the kaleidoscopic cell with which they are associated at least once. The minimal surface elements are smoothly interconnected to form tubule layers which are stacked in a reflection image-like manner to form a honeycomb core having no internal discontinuities.

3,663,348

LOFTY AND SOFT NONWOVEN, THROUGH BONDED FABRIC

Gerald J. Liloia, North Brunswick; Louis F. May, Jr., Old Bridge; Norman Schiff, Kendall Park, all of N.J.; Frederick K. Mesek, Downers Grove, Ill.; Robert C. Shepherd, Oak Lawn, Ill., and William R. Strickel, Chicago, Ill., assignors to Johnson & Johnson

Continuation-in-part of application Ser. No. 515,874, Dec. 23, 1965, now abandoned. This application May 16, 1968, Ser. No. 729,784
Int. Cl. A61f *13/18*; B32b *5/16*; D04h *1/12*
U.S. Cl. 161—116 **14 Claims**



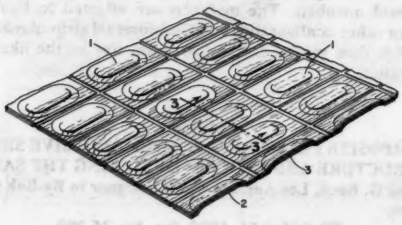
An improved lightweight fabric formed predominantly of short-length cellulosic fibers with a minor percentage of long fibers in a substantially homogeneous non-woven web, improved products such as a diaper made therefrom and improved methods of manufacture.

3,663,349

WALL PANEL

Fulvio Venturino, Corse Agnelli 38, Turin, Italy

Continuation-in-part of application Ser. No. 825-796, May 19, 1969, now abandoned. This application Mar. 18, 1971, Ser. No. 125,550
Int. Cl. B32b *1/00, 3/28*
U.S. Cl. 161—130 **4 Claims**



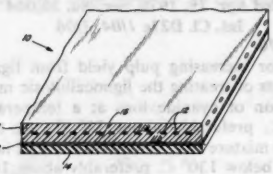
A wall panel comprising a central layer of fabric having glued thereto on one side a layer of veneer wood or imitation leather and provided on the other side with plastic material secured to the fabric by hot pressing so as to impart to the wall panel the geometric embossed form of the pressing die.

3,663,350

MEMBRANE SYSTEM

William S. Stokes, 18655 Clark, Apt. 23, Tarzana, Calif.

Filed Jan. 12, 1970, Ser. No. 2,075
Int. Cl. B32b *13/12, 25/08;* E04c *1/24*
U.S. Cl. 161—151 14 Claims



A leakproof membrane system including an outer sheet of fluid impervious, compression set resistant, synthetic polymer resin, a synthetic fiber scrim completely imbedded within the outer sheet, and an elastomeric layer coextensive with and adhesively bonded to the outer sheet. The elastomeric layer comprises an oriented rubber having preferred resilience within the plane of the layer. When installed on a substrate, fluid leakage to the substrate is prevented by the membrane system. Further, the elastomeric layer provides a "slip-sheet" effect, isolating the membrane outer sheet from movement or cracking of the substrate.

3,663,351

VAPOR PERMEABLE POLYURETHANE ADHESIVE AND FINISH LAYERS IN ARTIFICIAL LEATHER

Walter T. Murphy, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed July 24, 1970, Ser. No. 58,167
Int. Cl. B32b *5/18, 27/40*
U.S. Cl. 161—159 1 Claim

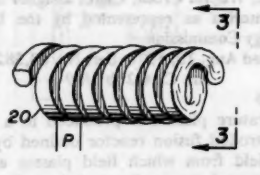
A vapor permeable adhesive based on a combination of polyurethane and water dissolved in tetrahydrofuran (THF) is supplied to adhere the elements of a vapor permeable laminate construction. As a thin top coating on the said laminate the said adhesive dries to form a durable microporous surface finish. A thixotropic viscosity improver added to the polyurethane-water-THF cement, insures acceptable moisture vapor permeability.

3,663,352

HELICALLY CRIMPED CONTINUOUS FILAMENT YARN

Joseph A. Self, Baton Rouge, La.; Gerald W. Sovereign, Gulf Breeze, Fla., and Alton E. Peacock, Chapel Hill, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 1, 1968, Ser. No. 772,766
Int. Cl. D02g *3/00*
U.S. Cl. 161—173 6 Claims



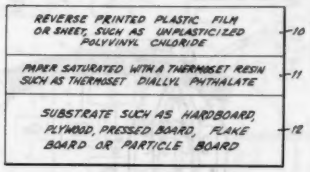
One side of a drawn homogeneous filament having at least 17 percent boiling water shrinkage is heated above its melting point while under high tension. The filament is then prebulked while under substantially no tension by being exposed to hot air at a temperature above the yarn glass transition temperature, soon after the initial heat treatment, and preferably before being wound. This produces a tighter crimp when the yarn is later subjected to hot water.

3,663,353

PLASTIC LAMINATE STRUCTURE CONSISTING OF A PLASTIC FILM LAMINATED TO A SUBSTRATE WITH A RESIN IMPREGNATED PAPER INTERMEDIATE LAYER

Jack D. Long, Cleveland, Ohio, and David Richards, Lunenburg, Mass., assignors to Fitchburg Paper Company, Fitchburg, Mass.

Continuation of application Ser. No. 602,797, Dec. 19, 1966, now abandoned. This application June 1, 1970, Ser. No. 41,740
Int. Cl. B32b *15/08, 27/08, 27/30*
U.S. Cl. 161—184 1 Claim


REVERSE PRINTED PLASTIC FILM OR SHEET, SUCH AS UNPLASTICIZED POLYVINYL CHLORIDE
10
PAPER SATURATED WITH A THERMOSET RESIN SUCH AS THERMOSET DIALLYL PHTHALATE
11
SUBSTRATE SUCH AS HARDBOARD, PLYWOOD, PRESSED BOARD, FLAKE BOARD OR PARTICLE BOARD
12

Laminated structures are disclosed wherein a reverse printed film of plastic such as polyvinyl chloride, Tedlar or polytetrafluoroethylene is joined to a substrate by means of a thermoset resin impregnated paper layer.

3,663,354

PRIMER FOR METALS

Hiroshi Ueno, Kawasaki-shi, and Seihichi Kobayashi, Yokohama-shi, both of Japan, assignors to Toyo Seikan Kabushiki Kaisha, Tokyo-to, Japan

Filed July 23, 1969, Ser. No. 844,154
Int. Cl. B32b *15/08, 27/34, 27/38*
U.S. Cl. 161—186 12 Claims

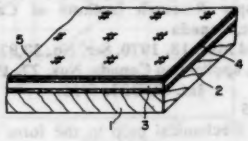
A primer which is adhesive to both metals and linear polyamides, and which is a precondensate of (1) a resol type phenolic resin prepared from a mixture of phenols comprising p-cresol and tri- or higher functional phenol and (2) an epoxy resin. A metal article coated with the primer having a linear polyamide coat thereon, and a bonded structure of prime-coated metal sheets bonded with a linear polyamide as a cement are also disclosed.

3,663,355

FLAME-PROOF AND NO-SMOKE-PRODUCING PLATE FOR ARCHITECTURAL USE

Keisuke Shimizu, 32-15, 2-chome, Wakabayashi, Setagaya-ku, Tokyo, and Kiichi Suzuki, 15-9, 1-chome, Yutaka-cho, Shinagawa-ku, Tokyo, both of Japan

Filed Mar. 23, 1970, Ser. No. 21,872
Claims priority, application Japan, May 10, 1969, 44/35832
Int. Cl. B32b *13/10*
U.S. Cl. 161—210 3 Claims



A flame-proof and no-smoke-producing wooden plate for architectural use comprising a wooden base plate, a layer of a water-proof composition formed on said wooden plate, a

layer of a water-soluble silicate selected from the group consisting of sodium silicate or potassium silicate formed on said layer of said water-proof composition, and an additional layer of a water-proof composition formed on said water-soluble silicate layer. Each of said water-proof compositions is formed by adding to a water-soluble silicate selected from the group consisting of sodium silicate and potassium silicate a dicalcium silicate material which combines with a water-soluble silicate to produce a self-setting mixture.

3,663,356

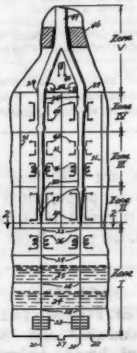
REINFORCED METAL-MATRIX COMPOSITES

Chou H. Li, 379 Elm Drive, Roslyn, N.Y.

Filed Oct. 23, 1968, Ser. No. 769,938

Int. Cl. B21c *37/00*; **B23p** *17/00*; **B32b** *15/04*

U.S. Cl. 161—225 **27 Claims**



The invention discloses the structure of, and method and apparatus for making, improved metal-matrix composites. Each of the composites comprises a strain-hardenable metal matrix, and a plurality of high-strength, high-modulus, elongated reinforcing members arranged in spatial relationship therein. Each of the members is effectively bonded to the surrounding matrix at discrete regions along its length, so as to locally strain the matrix around the discretely bonded regions upon application of load on the composite. Being thus locally strained, the matrix is spatially selectively and differentially strain-hardened and strengthened near the bonded regions. The spheres of influence of the straining and strain-hardening in the matrix near the bonded regions on one member are designed to significantly overlap similar spheres of influence near the neighboring members. This composite structure substantially increases mechanical interaction and load transfer ability between the members through the intervening hardened and strengthened matrix.

3,663,357

BLEACHING OF MECHANICAL CELLULOSIC PULP WITH OZONE IN THE PRESENCE OF A PEROXYGEN COMPOUND

Norman Liebergott, Chomedey, Laval, Canada, assignor to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada

Filed Mar. 18, 1970, Ser. No. 20,824

Claims priority, application Canada, Nov. 27, 1969, 068,520

Int. Cl. D21c *9/16*

U.S. Cl. 162—65 **10 Claims**

Bleaching of mechanical pulp in the form of fibers and fiber aggregates by adding a peroxygen compound to moist pulp to provide a mixture of pulp and peroxygen compound and thereafter treating said mixture with an ozone containing gaseous mixture.

3,663,358

A METHOD FOR INCREASING BISULFITE PULP YIELD COMPRISING TREATING LIGNOCELLULOSIC MATERIAL WITH CYANIDE IONS AT A PH OF 7–12 PRIOR TO DIGESTION

Sten I. Falkehag, Charleston; Alan M. Bills, Summerville, both of S.C., and Harold L. Hintz, Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Apr. 29, 1970, Ser. No. 33,044

Int. Cl. D21c *1/04, 3/06*

U.S. Cl. 162—70 **6 Claims**

A process for increasing pulp yield from lignocellulosic material consists of treating the lignocellulosic material with either a solution of cyanide ions at a temperature below about 130° C., preferably about 75° C., or treating the material with a mixture of cyanide-bisulfite ions in solution at a temperature below 130° C. preferably about 100° C., and digesting at conventional neutral or acid bisulfite conditions. The treatment of wood prior to neutral or acid bisulfite digestion with either cyanide ion alone or a combination of cyanide-bisulfite results in pulps having increased yield and improved brightness stability over untreated bisulfite cooks.

3,663,359

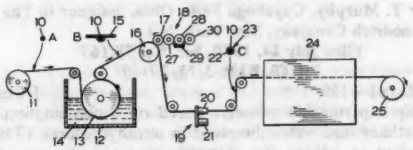
COLOR CODING OF PULP INSULATED CONDUCTORS

David H. Braim, Lachine, Quebec, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed May 1, 1970, Ser. No. 33,771

Int. Cl. D21h *3/82*

U.S. Cl. 162—105 **6 Claims**



A method and apparatus for the intermittent marking or color coding of an absorbent sheath on a continuous wire strand, obtained by forming pulp material as a ribbon parallel to the wire and wrapping the pulp ribbon laterally about the wire, in which lateral stripes of dye are applied at spaced intervals to that surface of the pulp ribbon opposite the wire after the ribbon is formed and before it is wrapped around the wire. The dye stripes are applied to the pulp ribbon, while wet, by a marking roller located between a pulp vat and a polisher, and the stripes extend laterally the width of the ribbon.

3,663,360

CONVERSION OF HIGH TEMPERATURE PLASMA ENERGY INTO ELECTRICAL ENERGY

Richard F. Post, Walnut Creek, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

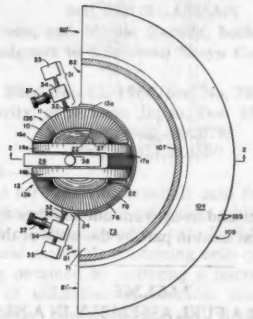
Filed Aug. 13, 1970, Ser. No. 63,582

Int. Cl. G21b *1/00*

U.S. Cl. 176—3 **17 Claims**

High temperature plasma is produced in a containment zone of a controlled fusion reactor defined by a magnetic containment field from which field plasma emerges as a beam. The plasma beam is directed through the magnetic field of an expander which expander field is coupled to the containment field and diminishes in intensity therethrough so that rotational energy of the plasma ions is converted to translational kinetic energy. An arrangement is provided at the outlet of the expander to separate electrons from the high energy ions which ions are then directed into a collector

structure. The collector structure comprises a plurality of stages maintained at progressively higher positive potentials wherein the ions are progressively decelerated so that successive fractions of the ions passes residual kinetic energies less than the differential potential between successive collector stages. The collector stages are provided with a deflector means which selectively deflects the ions with low residual kinetic energies to impinge upon collector plates to create electrical current at the stage potential. In one disclosed em-



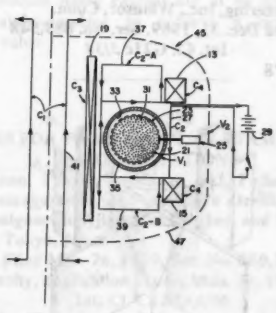
bodiment the selective deflector means utilizes a vapor jet charge exchange arrangement, in a second, the selective deflector means is an arrangement using crossed electric and magnetic fields, and, in a third, the selective deflector means utilizes particle focussing lenses. Electrical circuitry means are provided for combining and/or converting the individual collector currents for delivery to an electrical distribution system with means to establish the initial decelerating or retarding potentials.

3,663,361

NUCLEAR FUSION DEVICE OF THE AIR-CORE TOKAMAK TYPE

Shoichi Yoshikawa, Princeton, N.J., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 17, 1970, Ser. No. 11,994
Int. Cl. G21b *21/00*
U.S. Cl. 176—3 **7 Claims**



An air-core tokamak having high symmetry for providing an increased ratio of plasma radius over the major radius, stability, high B and minimizing field error, as well as a low aspect ratio, high accessibility to the plasma, and separation of the plasma column from the proximity of the material of the vacuum container wall and limiters.

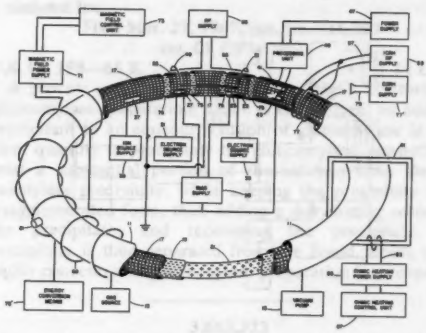
The toroidal confinement device has an air-core toroidal solenoid disposed along the inside diameter of the plasma column for producing a toroidal electric field, and spaced apart, toroidal conductors disposed along the outside diameter of the plasma column for compensating for the return flux of said solenoid and providing a transverse magnetic field for stably confining the plasma.

3,663,362

CONTROLLED FUSION REACTOR

Thomas H. Stix, Princeton, N.J., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 22, 1970, Ser. No. 100,734
Int. Cl. G21b *1/00*
U.S. Cl. 176—4 **17 Claims**



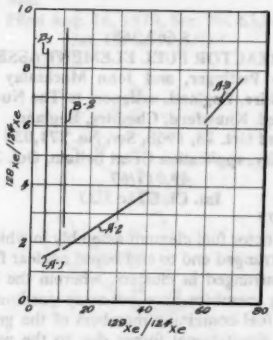
Method and apparatus for plasma confinement and/or heating in a toroid-like magnetic system, wherein a dense electron-rich sheath is maintained between the surface of a toroid-like body of quasi-neutral plasma and an adjacent conducting wall or grid in order to create a deep electrostatic potential well for the ions of said quasi-neutral plasma and thus to enhance the confinement of ions in said system and/or to accelerate injected ions for the heating of said plasma.

3,663,363

IDENTIFICATION OF FAILED FUEL ELEMENTS

Carl E. Crouthamel, Glen Ellyn; Lester F. Coleman, Wheaton; George J. Bernstein, Park Forest, all of Ill., and Peter B. Henault, Idaho Falls, Idaho, assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 13, 1969, Ser. No. 806,942
Int. Cl. G21c *17/04*
U.S. Cl. 176—19 LD **1 Claim**



Each subassembly in a breeder reactor is tagged with a gas containing a different mixture of xenon isotopes having a

mass number from 124 to 130. The reactor cover gas is tested for fission-product gases and if any are found they are tested for light xenon isotopes to identify which subassembly has failed.

3,663,364

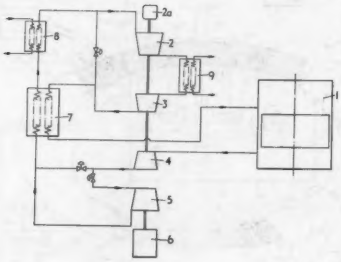
NUCLEAR REACTORS OPERATING IN CONJUNCTION WITH GAS TURBINES

John Thompson, and Roger Davison Vaughan, both of Knutsford, England, assignors to The Nuclear Power Group Limited, Knutsford, Cheshire, England

Filed Sept. 23, 1969, Ser. No. 860,188

Int. Cl. G21c *15/28*; G21d *1/02*

U.S. Cl. 176—65 **4 Claims**



A thermal power plant employing a gas cooled nuclear reactor comprising a closed cycle gas turbine plant having at least one compressor driven by at least one compressor turbine, at least one work turbine mechanically separate from the compressor turbine and coupled to an electrical generator, and at least one heat exchanger for heating the working fluid, the plant incorporating duct means for conveying the working fluid in a closed path through the compressor, through one side of a heat exchanger, through the nuclear reactor, through the compressor turbine, through the work turbine and thence through the other side of the heat exchanger before re-entering the compressor, the arrangement being that the compressor turbine and compressor are arranged vertically within a first cavity in a concrete pressure vessel, the heat exchanger is arranged in a second vertical cavity within the pressure vessel and the reactor core within a third vertical cavity, extending transversely across the vessel with respect to the other cavities, the four cavities being interconnected for the passage of working fluid through the gas turbine plant and reactor core.

3,663,365

NUCLEAR REACTOR FUEL ELEMENT ASSEMBLIES

Donald Stanley Pettinger, and John Mackinlay Yellowlees, both of Cheshire, England, assignors to The Nuclear Power Group Limited, Knutsford, Cheshire, England

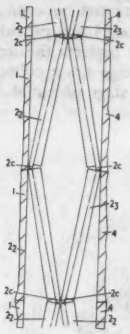
Filed Oct. 28, 1968, Ser. No. 771,035

Claims priority, application Great Britain, Oct. 27, 1967, 49,011/67

Int. Cl. G21c *3/23*

U.S. Cl. 176—77 **5 Claims**

A nuclear reactor fuel element assembly in which a plurality of sleeves arranged end to end house nuclear fuel-containing members arranged in clusters, wherein the ends of the fuel-containing members have cut-away portions or projections and the fuel-containing members of the groups are so disposed that gravitational forces due to the weight of the fuel-containing members of the group, when the assembly is located in a vertical channel in a reactor core, act to produce couples on the members causing them to lean at one end towards one another in mutually supporting relationship and



to lean at the other end away from one another against fixed surfaces provided at least in part by the walls of the sleeves.

3,663,366

SHROUD FOR A FUEL ASSEMBLY IN A NUCLEAR REACTOR

Tor Ole Sauar, Stabekk, Norway, assignor to Institutt for Atomenergi, Kjeller, Norway

Filed Apr. 3, 1969, Ser. No. 813,296

Claims priority, application Norway, Apr. 6, 1968, 1351/68

Int. Cl. G21c *3/30, 3/38*

U.S. Cl. 176—68 **1 Claim**

In nuclear reactors utilizing water both as moderator and coolant, shrouds are frequency applied for the direction and confinement of the coolant flow along the fuel element.

In a reactor according to the invention, however, said shrouds also serve another purpose, namely to provide the reactor core with burnable poison, which will advantageously modify the operation of the reactor in several ways.

According to the invention it is considered convenient to disperse said burnable poison in sheets of stainless steel, which form an internal layer of a zirconium alloy. Said shroud will then be constructed from such compound plates.

3,663,367

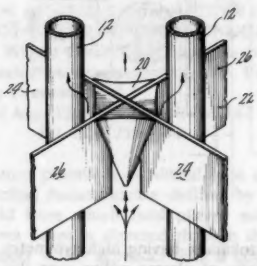
FLOW DEFLECTOR FOR NUCLEAR FUEL ELEMENT ASSEMBLIES

John N. Calvin, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 31, 1969, Ser. No. 889,548

Int. Cl. G21c *3/34*

U.S. Cl. 176—78 **9 Claims**



A nuclear reactor fuel element assembly containing a plurality of spaced parallel fuel elements is provided with in-

verted conical or pyramidal deflector elements in the coolant flow channels between the fuel elements to divert the coolant flow. This disrupts the coolant layer adjacent to the fuel elements, promotes the mixing of coolant from various channels and raises the critical heat flux. The deflector elements are supported in position at the points of intersection of a grid structure which may also be a support grid for the fuel elements.

3,663,368

METHOD FOR REMOVING LEVULINIC ACID BY MICROORGANISMS

Takahiro Ueno, and Michio Harada, both of Takasago-shi, Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda-shi, Japan

Filed Dec. 12, 1968, Ser. No. 783,202
Claims priority, application Japan, Dec. 18, 1967, 42/80632; Oct. 1, 1968, 43/70785
Int. Cl. C12b *1/00*
U.S. Cl. 195—4 **10 Claims**

A method for removing levulinic acid from a liquid containing levulinic acid which comprises adding materials containing cells of microorganisms to a liquid containing levulinic acid, said materials containing cells of microorganisms having been obtained by culturing a microorganism having the ability of utilization of levulinic acid in said liquid. Microorganisms employed include *Arthrobacter simplex* ATCC 6946, *Brevibacterium linens* ATCC 21330, *Corynebacterium equi* ATCC 21329 and *Pseudomonas aeruginosa* ATCC 21328.

3,663,369

HYDROLYSIS OF STARCH

Alpha L. Morehouse; Ronald C. Malzahn, and John T. Day, all of Muscatine, Iowa, assignors to Grain Processing Corporation, Muscatine, Iowa

Filed Feb. 23, 1968, Ser. No. 707,557
Int. Cl. C12b *1/00*
U.S. Cl. 195—31 **9 Claims**

Low conversion starch hydrolyzate products having dextrose equivalent values not substantially above 18 and characterized by a unique saccharide composition, good clarity and little tendency of retrogradation in solution. Methods for preparing low conversion starch hydrolyzates by a two-stage hydrolysis; hydrolysis in the first stage being carried out with acids or enzymes at elevated temperatures for short periods to achieve liquefaction of the starch with very little dextrinization or saccharification and the second stage of the hydrolysis being carried out at an alkaline pH with bacterial alpha-amylase to achieve a desired dextrose equivalent value.

3,663,370

PROCESS FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION

Kageaki Kono, Tokyo; Toshikazu Oki, Fujisawa-shi; Atsuo Kitai, Kamakura-shi, and Asaichiro Ozaki, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc. and Sanraku Ocean Co. Ltd., Tokyo, Japan

Filed Mar. 26, 1969, Ser. No. 810,785
Claims priority, application Japan, Mar. 30, 1968, 43/20617
Int. Cl. C12d *13/06*
U.S. Cl. 195—49 **7 Claims**

L-Glutamic acid is produced by fermentation of culture media containing methanol as the main or sole carbon source by certain strains of microorganisms of the genera Methanomonas, Protaminobacter, and Microcyclus. The glutamic acid yield is improved by the presence of thiamine in the medium, and thiamine is required for growth of some of the microorganisms.

3,663,371

METHOD OF PRODUCING DEXTRANASE

John P. Viccaro, Jamaica, N.Y., and John M. Weaver, Glen Rock, N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed May 26, 1970, Ser. No. 40,723
Int. Cl. C12d *13/10*
U.S. Cl. 195—66 R **6 Claims**

Dextranase is obtained by propagating *Penicillium aculaetum* in a nutrient medium containing dextran and thereafter recovering the enzyme from the medium.

3,663,372

METHOD OF PREPARING A DRIED GLUCOAMYLASE PREPARATION

Jay Allen Smith, Downers Grove, Ill., assignor to CPC International Inc.

Filed Mar. 27, 1969, Ser. No. 811,252
Int. Cl. C07g *7/02*
U.S. Cl. 195—66 R **11 Claims**

A process is set out for producing a highly concentrated glucoamylase preparation, which is carrier-free, by adding a precipitant to an aqueous solution of glucoamylase in sufficient quantity to precipitate the glucoamylase; separating at least a substantial portion of the solution from the glucoamylase precipitate, while keeping the precipitate in an unagglomerated form; then adding a dehydrating solvent to the precipitate; and recovering the precipitate. The precipitate is then separated from the liquid, dried, and a highly concentrated glucoamylase preparation is recovered.

3,663,373

PROCESS FOR THE PREPARATION OF IODININ

Julius Berger, Passaic; Richard H. Epps; Edward M. Jenkins, both of Montclair, and Benjamin Tabenkin, Upper Montclair, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed Feb. 24, 1970, Ser. No. 13,785
Int. Cl. C12d *9/00*
U.S. Cl. 195—96 **9 Claims**

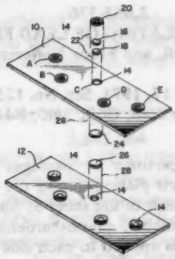
A method for producing iodinin through the cultivation of selected isolates of the organism *Brevibacterium iodinum*. Cultivation takes place in a specialized nutrient medium and the iodinin is isolated by extraction. Iodinin is a valuable chemical intermediate used in the preparation of the known pharmaceutically useful antibiotic myxin.

3,663,374

METHOD AND APPARATUS FOR QUANTITATING ENZYME ACTIVITY

Rudolph H. Moyer, West Covina, and Donald J. Sibbett, Cucamonga, both of Calif., assignors to Geomet, Incorporated, Rockville, Md.

Filed Aug. 14, 1970, Ser. No. 63,842
Int. Cl. G01n *31/14*
U.S. Cl. 195—103.5 R **10 Claims**



Method and apparatus for quantitating enzyme activity in blood and other fluids, using a spot test technique. The test

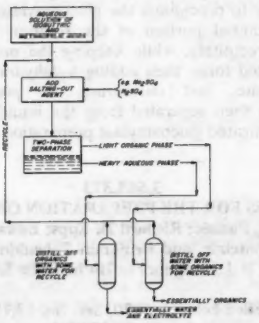
utilizes enzyme standards freeze-dried in absorbent discs held under a membrane filter. Other discs above the filter contain substrate, cofactors, and indicators. The spot test plates are entirely self-contained, requiring neither instrumentation nor measurement of fluid volumes, and the test can be carried out under any ambient conditions. The test is particularly applicable to emergency screening requirements, such as may occur in hospital receiving rooms, doctors' offices, ambulances, or whereever rapid diagnosis of myocardial infraction may be required.

3,663,375

SEPARATION OF COMPONENTS FROM A REACTION PRODUCT MIXTURE OF WATER ISOBUTYRIC ACID AND METHACRYLIC ACID BY PHASE SEPARATION AND DISTILLATIONS

John Maurice Witheford, Wyckoff, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 31, 1970, Ser. No. 24,362
Int. Cl. B01d *3/34;* **C07c** *53/22, 57/04*
U.S. Cl. 203—15 **6 Claims**



To separate aqueous and organic components of a mixture of isobutyric acid, water and methacrylic acid, the mixture is initially separated by salting out by means of a water soluble electrolyte e.g. sodium sulfate, which causes separation of aqueous and organic phases. Residuals in each phase are distilled off as a low-boiling mixed distillate resembling an azeotropic mixture which is returned for repeated separation by salting-out. Organics are further separated by fractional distillation.

ERRATUM

For Class 203—91 see:
Patent No. 3,663,382

3,663,376

SELECTIVE SPOT PLATING OF LEAD FRAME SHEETS

Gary Uchytil, Campbell, and Franz Kolterer, Los Altos, both of Calif.

Filed Mar. 17, 1971, Ser. No. 125,237
Int. Cl. C23b *5/48;* **G03c** *5/00;* **B44d** *1/18*
U.S. Cl. 204—15 **13 Claims**

Relatively small apertures or passages in a sheet are masked to prevent their plating during the electroplating of selected zones of one side of the sheet by filling the apertures with a readily deformable, photo-hardenable material. A photosensitive facing is applied to each side of the sheet and the side including the plated zones is masked with a shield placed thereover to define the zones. Thereafter, both sheet sides are subjected to light, the shield is removed and the sheet is placed in a developing tank for removal of facing portions overlying the zones and the zones of the sheet are electroplated. Thereafter, the remaining facings and the

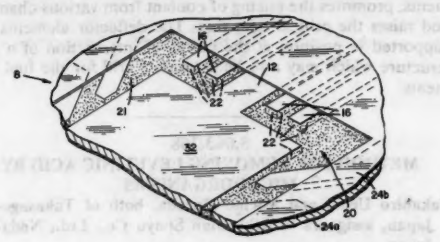


photo-hardenable material are stripped to bare both sheet sides and the apertures for the subsequent use of the sheet.

3,663,377

ELECTROPLATABLE POLYOLEFINS

Habet M. Khelghatian, and Wassily Poppe, both of P.O. Box 426, Springfield, Pa.

Continuation of application Ser. No. 802,645, Feb. 26, 1969, now abandoned. This application May 8, 1970, Ser. No. 33,178
Int. Cl. C23b *5/60*
U.S. Cl. 204—30 **9 Claims**

In the art of electroplating polyolefins, adhesion of the plated metal to the polyolefin is enhanced by incorporating into the polyolefin from 0.1 to 2 percent by weight of at least one surface active agent such as a nonionic, cationic or anionic surfactant.

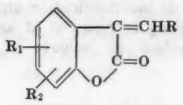
3,663,378

ELECTROPLATING OF NICKEL

Henry Brown, Huntington Woods, Mich., assignor to Udylite Corporation, Warren, Mich.

Continuation-in-part of application Ser. No. 812,377, Apr. 1, 1969, now abandoned. This application Mar. 16, 1971, Ser. No. 124,941
Int. Cl. C23b *5/08, 5/46*
U.S. Cl. 204—49 **8 Claims**

An aqueous acidic nickel plating bath which contains a brightening amount of a compound having the formula:



wherein R_1 and R_2 are H, CH_3, C_2H_5, F, Cl, Br, CH_3O-, C_2H_5O-, CH_3CO-, CH_3CONH-, $-O(CH_2)_n-SO_3H$, $-O(CH_2)_n-SO_3H$, C_2H_5CO-, or C_2H_5CONH-. R is H, F, Cl or phenyl, and n is a number from 1 to 6 inclusive.

3,663,379

METHOD AND ELECTROLYTES FOR ANODIZING TITANIUM AND ITS ALLOYS

Earl W. Kendall, Bonita, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed July 1, 1969, Ser. No. 838,342
Int. Cl. C23b *11/02*
U.S. Cl. 204—56 **7 Claims**

Titanium and its alloys are anodized by making the metal the anode in an electrolytic system which utilizes carbon as the cathode and an electrolyte consisting of water, both a silicate and a perborate of an alkali metal, the hydroxide of an

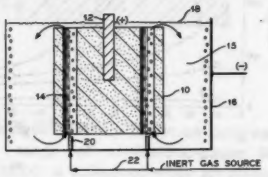
alkali metal, and the alkali metal salt of an acid selected from the group consisting of ethylenediamine tetraacetic acid, diethylenetriamine pentaacetic acid, and mixtures thereof. Direct current applied to the system may be varied between 10 and 50 amperes per square foot of anode surface, with EMF pressures not exceeding a rate of 8 volts per minute until the current threshold is obtained.

3,663,380

ELECTRODES FOR ELECTROLYTIC CONVERSION

King L. Mills, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Mar. 2, 1970, Ser. No. 15,389
Int. Cl. B01k *3/00*
U.S. Cl. 204—59 **11 Claims**



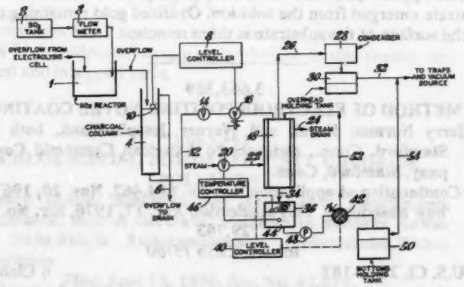
An electrode employed in an electrolytic cell is provided with at least one passageway extending therethrough, preferably in a generally vertical direction. Electrolyte circulates through said passageway and cools said electrode. If desired, circulation of said electrolyte can be enhanced by introducing an inert gas into said passageway.

3,663,381

ELECTROCHEMICAL CONVERSION OF PHENOL TO HYDROQUINONE

Frank H. Covitz, Lebanon, and Robert V. Carrubba, Cranford, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 9, 1970, Ser. No. 26,924
Int. Cl. C07b *29/06*; C07c *37/00*
U.S. Cl. 204—78 **10 Claims**



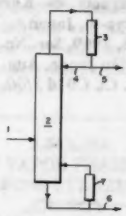
The electrochemical conversion of phenol to hydroquinone has been improved by a combination of steps directed to effect removal of by-products and conversion of p-benzoquinone to hydroquinone as part of the process for the recovery of the hydroquinone product. These steps include first reducing residual p-benzoquinone to hydroquinone, followed by removal of tars and color bodies, vacuum distillation to condense the volume of the electrolyzed reaction mixture, and finally crystallizing the hydroquinone product out of the condensed distillation residue.

3,663,382

PROCESS OF RECOVERING HYDROGEN FLUORIDE FREE OF ARSENIC BY DISTILLATION

George J. Garris, Deer Park, Tex., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 19, 1969, Ser. No. 851,359
Int. Cl. B01d *3/10*
U.S. Cl. 203—91 **2 Claims**



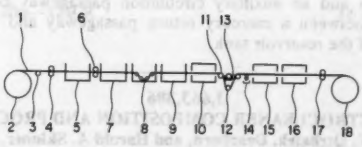
Anhydrous hydrogen fluoride containing less than about 3,000 parts per billion of arsenic is produced by distilling hydrogen fluoride at a pressure below 25 pounds per square inch absolute.

3,663,383

METHOD FOR MANUFACTURING PAINTED METAL SHEET

Shozo Matsuda; Tadashi Tanaka, both of Kawasaki; Kouzou Murayama; Kunimitsu Yamamoto, both of Matsudo; Joji Oka, Kawasaki; Royji Takahashi, Katsushika-gun, and Megumi Koyama, Matsudo, all of Japan, assignors to Yawata Iron & Steel Co., Ltd. and Yawata Econ Steel Co., Tokyo, Japan

Filed June 5, 1968, Ser. No. 734,801
Claims priority, application Japan, June 5, 1967, 42/35900; June 12, 1967, 42/50450; June 19, 1967, 42/39147
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—181 **10 Claims**



A method for manufacturing a painted metal sheet by successive paintings comprises the steps of (a) subjecting a metal sheet plated with zinc or zinc alloy to an electrophoretic treatment with a water-soluble resin series paint to provide an undercoating, then (b) painting the steel sheet having the electro-deposited paint coating with a water-soluble or solvent-soluble paint to provide a final coat, and then (c) baking and drying the undercoat and the final coat at the same time.

Step (a) may optionally be preceded by a step of subjecting the initial metal sheet, plated with zinc or zinc alloy, to a chemical-synthetic treatment to form a foundation for subsequent painting.

3,663,384

BATH FOR ELECTROPLATING TIN-BISMUTH ALLOY

Jean P. Lescure, Montpellier, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 8, 1970, Ser. No. 79,272
Claims priority, application France, Dec. 19, 1969, 6944284
Int. Cl. C23b *5/38*
U.S. Cl. 204—43 **6 Claims**

Bath for electroplating tin-bismuth alloy upon a metal object such as a frame of a computer, including fluoboric acid

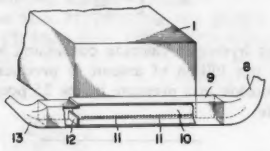
in order to maintain the pH acid, tin fluoborate and a bismuth oxide-bismuth sulphate mixture of low quantity. The utilized method is of the soluble anode type and the cathode is formed of the object to be coated.

3,663,385

ALKALI SALT ELECTROLYSIS BY MERCURY PROCESS

Hiroshi Shibata; Teruo Imai, and Shigeji Kumaki, all of Iwaki-shi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 25, 1969, Ser. No. 852,582
Claims priority, application Japan, Aug. 30, 1968, 43/61725
Int. Cl. C01d *3/00*
U.S. Cl. 204—99 1 Claim



In an alkali salt electrolysis operation by the mercury process wherein mercury recovered in a denuding tower is recirculated with wash water through a mercury return passageway to be returned to an electrolytic cell, a portion of the mercury is caused to constantly overflow together with washing water over a weir provided in the mercury return passageway and then to undergo auxiliary circulation to a mercury reservoir interposed between the denuding tower and a mercury pump.

An alkali chloride electrolytic apparatus, in which a reservoir tank is provided between a denuding tower and a mercury pump and an auxiliary circulation passageway communicates between a mercury return passageway and an entrance of the reservoir tank.

3,663,386

ELECTROCLEANER COMPOSITION AND PROCESS

Joseph V. Otrhalek, Dearborn, and Harold A. Skinner, Wyandotte, both of Mich., assignors to Basf Wyandotte Corporation, Wyandotte, Mich.

Filed Feb. 8, 1971, Ser. No. 113,752
Int. Cl. C23b *1/00, 1/04*
U.S. Cl. 204—141 7 Claims

Electrolytic caustic cleaning compositions are improved by adding to the composition from 0.33 to 3.0 percent by weight of the dry cleaning composition a monophosphate ester of oxyalkylated alcohol. The phosphate ester improves the cleaning efficiency of the electrolytic process and at the same time, minimizes the formation of spray, mist and the discharge of gases from the bath.

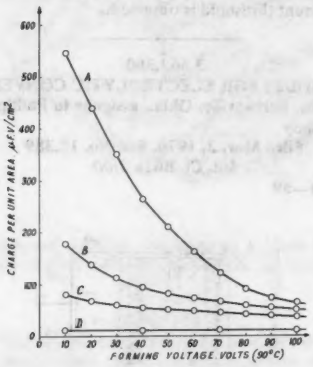
3,663,387

MANUFACTURE OF ELECTRODE FOIL FOR ELECTROLYTIC CAPACITORS

Donald Keith Harrison, West Lothian, Scotland, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Mar. 1, 1971, Ser. No. 122,615
Claims priority, application Great Britain, Mar. 5, 1970, 10,536/70
Int. Cl. C23b *1/00*
U.S. Cl. 204—141 7 Claims

Very high gain etching of tantalum foil is achieved by effecting before electrolytic etching with an electrolyte containing lithium chloride, brushing of the surface of the foil



with steel wool so as to produce local iron contamination of the tantalum.

3,663,388

GOLD REMOVAL PROCESS

Clarence L. Hedman, Jr., Campbell, Calif., assignor to SCM Corporation, New York, N.Y.

Filed Oct. 28, 1970, Ser. No. 84,908
Int. Cl. B01k *1/00;* B23p *1/00*
U.S. Cl. 204—146 10 Claims

A process for removing gold from a gold-coated substrate is disclosed. The gold-coated substrate is submerged in an electrolytically conductive solution. An electrode is also placed in the solution in spaced relation with the gold coating. A potential difference is applied across the electrode and the gold coating to render the coating positive with respect to the electrode thereby causing the gold coating to be oxidized. The applied potential difference is terminated and the substrate emerged from the solution. Oxidized gold remaining on the surface of the substrate is them removed.

3,663,389

METHOD OF ELECTRODEPOSITING NOVEL COATING

Jerry Norman Koral, and Werner Joseph Blank, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of application Ser. No. 684,467, Nov. 20, 1967, now abandoned. This application Apr. 17, 1970, Ser. No. 29,703
Int. Cl. C23b *13/00*
U.S. Cl. 204—181 6 Claims

A process for electrocoating metal comprising immersing said metal in an aqueous dispersion of a mixture of from about 5 percent to about 40 percent, by weight, of (A) a mixture of substantially water-insoluble, substantially fully etherified tetramethylol guanamines and correspondingly from about 95 percent to about 60 percent, by weight, of (B) a water dispersible non-gelled polymeric material carrying an ionic charge which is heat reactive with (A) wherein said percentages by weight, total 100 percent and are based on the total solids weight of (A) and (B), and subjecting the aqueous dispersion to electrophoresis in order to deposit the mixture of (A) and (B) on the metal as an adherent film, is disclosed.

3,663,390

METHOD OF CHANGING COLOR PLAY RANGE OF LIQUID CRYSTAL MATERIALS

James L. Fergason, Kent, Ohio, and Newton N. Goldberg, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original application Aug. 22, 1968, Ser. No. 754,582. Divided and this application Sept. 24, 1970, Ser. No. 75,180
Int. Cl. B01j 1/10
U.S. Cl. 204—158 HE 6 Claims

Increasing dosages of X-ray radiation progressively lower the color-play range of cholesteric-phase liquid-crystal materials. The effect is enhanced when an effective amount of an iodine-containing compound is used in the liquid-crystal material. Novel iodine-containing compounds are described, and articles are disclosed that give direct reading indication of the dosage of X-ray radiation that they have received, without need for a separate development operation.

3,663,391

SOLUTION POLYMERIZATION OF ETHYLENE BY IONIZING RADIATION IN THE PRESENCE OF CHLOROFLUORINATED HYDROCARBONS

Tsutomu Kagiya, Kyoto-shi; Miyuki Hagiwara, and Hidemasa Okamoto, both of Takasaki-shi, all of Japan, assignors to Japan Atomic Energy Research Institute

Filed Apr. 17, 1969, Ser. No. 817,005
Claims priority, application Japan, Apr. 25, 1968, 43/28107
Int. Cl. C08d 1/00, 3/04; C08f 1/16
U.S. Cl. 204—159.22 4 Claims

Ethylene is irradiated with ionizing radiation under high pressure and in the presence of a chlorofluorinated hydrocarbon represented by the general formula

$$C_nF_mCl_{2n+2-m}$$

wherein n is 1 or 2 and m is 1–3 when n is 1 and 1–5 when n is 2. A high molecular weight polyethylene is this readily obtained and in a good yield.

3,663,392

CHLORINATING POWDERED VINYL CHLORIDE POLYMERS

Gerhard Zeitler, Hessheim, and Hans-Georg Trieschmann, Hambach, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed June 18, 1970, Ser. No. 47,578
Claims priority, application Germany, June 27, 1969, P 19 32 589.4
Int. Cl. C08f 27/02
U.S. Cl. 204—159.18 6 Claims

A process for the chlorination of vinyl chloride polymers in which a powdered vinyl chloride polymer is treated in a first stage with gaseous chlorine at below the softening point and under the action of light followed by a second stage in which it is treated at above the softening point while excluding light.

The products are homogeneously chlorinated and have a high thermostability; they may be used as special glasses and for hot water pipes.

3,663,393

IRRADIATION METHOD OF PREPARING ARALKYL HYDROPEROXIDES FROM HYDROCARBONS

Harold K. Latourette, Yardley, Pa., assignor to FMC Corporation, New York, N.Y.

Filed Sept. 3, 1968, Ser. No. 757,125
Int. Cl. B01j 1/10
U.S. Cl. 204—162 R 4 Claims

Primary benzylic hydroperoxides, useful in the production of aromatic acids, aldehydes and alcohols, are obtained by oxidizing a methylated aromatic hydrocarbon with oxygen under high pressure at low temperature in the presence of a radical-forming activator.

3,663,394

PROCESS FOR THE VAPOR PHASE REARRANGEMENT OF HYDROCARBONS UTILIZING MICROWAVE ENERGY

Yoshio Kawahara, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 1, 1970, Ser. No. 42,493
Int. Cl. C07b 29/06; C07c 3/48
U.S. Cl. 204—168 3 Claims

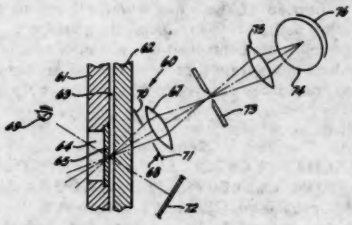
A process for the vapor phase rearrangement of hydrocarbons is disclosed wherein said hydrocarbons are subjected to a microwave electrical discharge maintained by an incident power of from about 500 watts to about 5 megawatts, said feed having a residence time of no more than about 0.02 seconds, residence time being defined as the time required for a molecule to travel through the visible glow discharge zone in a given reactor.

3,663,395

CROSS-SECTION ILLUMINATOR FOR A CONTINUOUS PARTICLE ELECTROPHORESIS CELL

Allen Strickler, Fullerton, Calif., assignor to Beckman Instruments, Inc.

Filed Dec. 17, 1969, Ser. No. 885,941
Int. Cl. B01k 5/00
U.S. Cl. 204—180 R 16 Claims



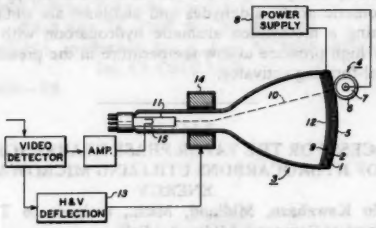
In a continuous particle electrophoresis cell, the present invention comprises means for illuminating a section of the electrolyte curtain with a narrow blade of light rather than with a broad beam which would flood the area of interest. Such blade of light illuminates the bands of sample particles only where they intersect the plane of light. By viewing the electrophoresis cell at a suitable angle, against a dark background, the cross-sectional pattern of the particle band distribution becomes fully visible. This provides a valuable, practical tool for gauging and optimizing instrument performance.

3,663,396

KINESCOPE PHOTOELECTROPHORETIC IMAGING METHOD AND SYSTEMS

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Feb. 2, 1970, Ser. No. 7,933
Int. Cl. B01k 5/00; G03g 17/00
U.S. Cl. 204—181 19 Claims



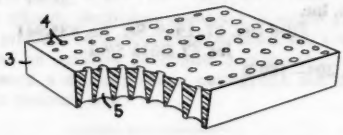
Black and white and color kinescopes are used as the exposure mechanism in a photoelectrophoretic imaging system. Images are formed on the face plate of a kinescope as a roller electrode travels over the face plate.

3,663,397

TREATMENT OF ELECTRODEPOSITION BATH

Louis R. Le Bras, Gibsonia, and John S. Ostrowski, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 883,584, Dec. 9, 1969, now abandoned. This application Sept. 14, 1970, Ser. No. 71,742
Int. Cl. B01k 5/02; C23b 13/00
U.S. Cl. 204—181 5 Claims



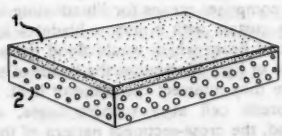
This invention relates to a method of rinsing articles coated by an electrodeposition process in such a manner that at least a portion of the rinse water returns to the electrodeposition bath, thereby reducing dragout losses. The percentage of solids are controlled by utilizing a membrane-controlled selective separation process such as an ultrafiltration process to control the electrodeposition bath composition.

3,663,398

ION EXCHANGE OF AN ULTRAFILTRATE DERIVED FROM AN ELECTRODEPOSITION BATH

Roger M. Christenson, Gibsonia, and Robert R. Zwack, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 879,769, Nov. 25, 1969, now abandoned. This application Sept. 14, 1970, Ser. No. 71,984
Int. Cl. B01k 5/02; C23b 13/00
U.S. Cl. 204—181 20 Claims



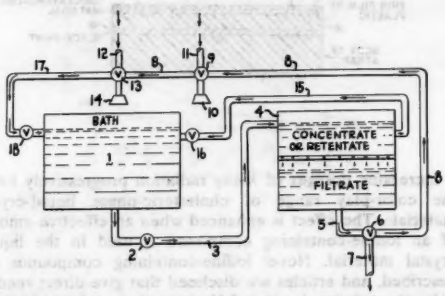
This invention relates to a method of treating and controlling the composition of electrodeposition baths. The process of the invention comprises ultrafiltration in combination with ion exchange of the filtrate derived from the ultrafiltration process.

3,663,399

TREATMENT OF ELECTRODEPOSITION BATH

Frederick M. Loop, North Olmsted, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 881,259, Dec. 1, 1969, now abandoned. This application Sept. 17, 1970, Ser. No. 73,093
Int. Cl. B01k 5/02; C23b 13/00
U.S. Cl. 204—181 15 Claims



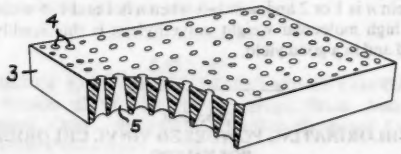
This invention relates to a method of rinsing articles coated by electrodeposition process which comprises using as the rinsing agent the effluent obtained from a selective separation process such as a filtration process, for example, ultrafiltration, utilized to control electrodeposition bath composition.

3,663,400

CONTROLLING SOLIDS IN ELECTRODEPOSITABLE COMPOSITIONS

Roger M. Christenson, and Louis R. Le Bras, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 814,789, Apr. 9, 1969, now abandoned. This application Sept. 23, 1970, Ser. No. 74,658
Int. Cl. B01l 15/02; C23b 13/00
U.S. Cl. 204—181 11 Claims



This invention relates to a method of controlling electrodeposition bath solids. More particularly, this is a method by which the concentration of solids in an electrodeposition bath is maintained at a desired level by utilizing a membrane-controlled selective separation process such as an ultrafiltration process.

3,663,401

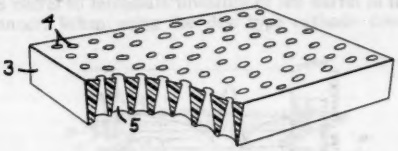
CONTROL OF WATER-SOLUBLE ACIDS IN AN ELECTRODEPOSITION BATH

Roger M. Christenson, and Louis R. Lebras, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 814,789, Apr. 9, 1969. This application Oct. 13, 1970, Ser. No. 80,374
Int. Cl. B01k 5/02; C23b 13/00
U.S. Cl. 204—181 21 Claims

This invention relates to a method of controlling water-soluble acids present in a base-solubilized electrodepositable

composition, which comprises subjecting the bath to a selec-



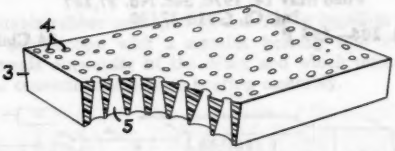
tive filtration process such as ultrafiltration and thereby removing water-soluble acids from the bath.

3,663,402

PRETREATING ELECTRODEPOSITABLE COMPOSITIONS

Roger M. Christenson, Gibsonia, and Robert R. Zwack, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 12, 1970, Ser. No. 88,533
Int. Cl. B01k *5/02*; **C23b** *13/00*
U.S. Cl. 204—181 **8 Claims**



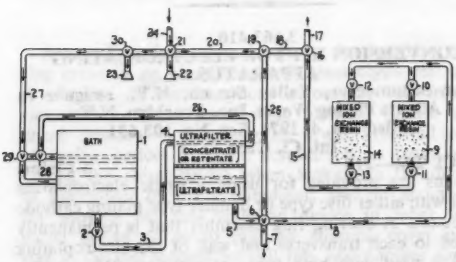
A method of pretreating electrodepositable compositions prior to utilization of such compositions, in an electrodeposition process, which comprises subjecting a synthetic resin ionically solubilized in an aqueous medium to a selective separation process such as ultrafiltration which passes an aqueous effluent through a physical barrier while retaining the solubilized resin component. The method enables the removal of deleterious impurities and contaminants which affect coating parameters and thus provides a direct method of controlling the quality of the deposited film.

3,663,403

DOUBLE ION EXCHANGE OF AN ULTRAFILTRATE DERIVED FROM AN ELECTRODEPOSITION BATH

Roger M. Christenson, Gibsonia, and Robert R. Zwack, Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 71,984, Sept. 14, 1970, which is a continuation-in-part of application Ser. No. 879,769, Nov. 25, 1969, now abandoned. This application Nov. 27, 1970, Ser. No. 93,088
Int. Cl. B01k *5/02*; **C23b** *13/00*
U.S. Cl. 204—181 **20 Claims**



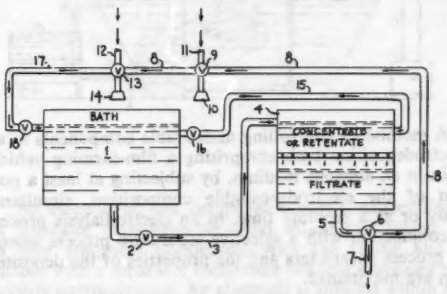
This invention relates to a method of treating and controlling the composition of an electrodeposition bath. The process of the invention comprises ultrafiltration in combination with double ion exchange of the filtrate derived from the ultrafiltration process.

3,663,404

TREATMENT OF ELECTRODEPOSITION BATH

Frederick M. Loop, North Olmsted, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 881,259, Dec. 1, 1969, now abandoned , and a continuation-in-part of 73,093, Sept. 17, 1970, which is a continuation-in-part of application Ser. No. 881,259, Dec. 1, 1969. This application Dec. 1, 1970, Ser. No. 94,023. The portion of the term of the patent subsequent to Feb. 15, 1989, has been disclaimed.
Int. Cl. B01h *5/02*; **C23b** *13/00*
U.S. Cl. 204—181 **10 Claims**



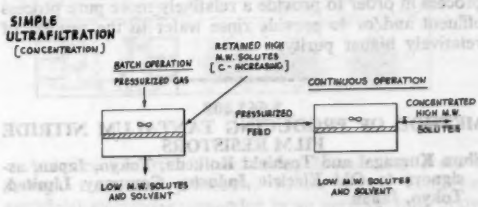
This invention relates to a method of rinsing articles coated by an electrodeposition process which comprises employing as at least a portion of the rinsing agent the effluent obtained from a selective separation process such as an ultrafiltration process, while withdrawing a portion of said effluent which contains excess and/or undesirable low molecular weight species present in the electrodepositable composition, thereby, first, conserving bath material and, second, controlling the composition of the electrodepositable composition.

3,663,405

ULTRAFILTRATION OF ELECTRODEPOSITABLE COMPOSITIONS

Roger M. Christenson and Louis R. Le Bras, Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 814,789, Apr. 9, 1969. This application Feb. 25, 1971, Ser. No. 118,681
Int. Cl. B01k *5/02*; **C23b** *13/00*
U.S. Cl. 204—181 **35 Claims**



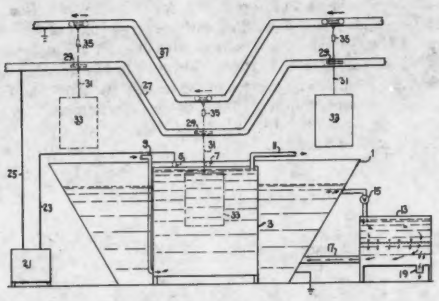
This invention relates to the use of a selective filtration technique such as ultrafiltration to control the composition of an electrodeposition bath comprising a solubilized synthetic organic vehicle resin.

3,663,406

COMBINED ELECTRODIALYSIS AND ULTRAFILTRATION OF AN ELECTRODEPOSITION BATH

Louis R. Le Bras, Gibsonia, and Robert R. Zwack, New Kensington, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 11, 1971, Ser. No. 123,299
Int. Cl. B01k 5/02; C23b 13/00
U.S. Cl. 204—181 13 Claims



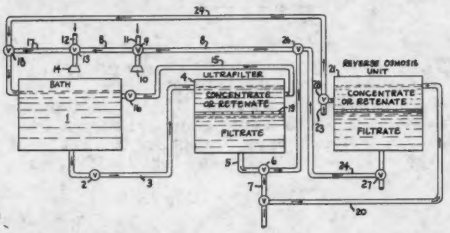
A method of controlling undesirable components in an electrodeposition bath comprising a film-forming vehicle resin in an aqueous medium, by subjecting at least a portion of the electrodepositable composition, simultaneously or at a separate time, to an electrodialysis process in conjunction with a selective separation process whereby process parameters and the properties of the deposited film are maintained.

3,663,407

TREATMENT OF AN ULTRAFILTRATE DERIVED FROM AN ELECTRODEPOSITION PROCESS BY REVERSE OSMOSIS

Frederick M. Loop, North Olmsted, and Frank C. Bosworth, Bay Village, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 21, 1971, Ser. No. 155,042
Int. Cl. B01k 5/02; C23b 13/00
U.S. Cl. 204—181 8 Claims



This invention relates to the use of reverse osmosis to treat ultrafiltrate derived from an electrodeposition process in order to provide a relatively more pure process effluent and/or to provide rinse water to the process of relatively higher purity.

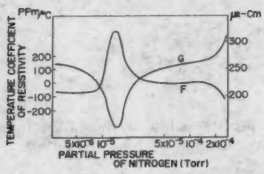
3,663,408

METHOD OF PRODUCING TANTALUM NITRIDE FILM RESISTORS

Shun Kumagai and Toshiaki Koikeda, Tokyo, Japan, assignors to Oki Electric Industry Company Limited, Tokyo, Japan

Filed July 22, 1969, Ser. No. 843,603
Int. Cl. C23c 15/00
U.S. Cl. 204—192 2 Claims

This invention is to conduct reactive sputtering by heating a substrate to a temperature of 300 to 550 ° C. while keeping the partial pressure of nitrogen at 3×10^{-5} to 2×10^{-4} torr in a high vacuum of less than 5×10^{-3} torr of the mixed pressure of argon and nitrogen so that



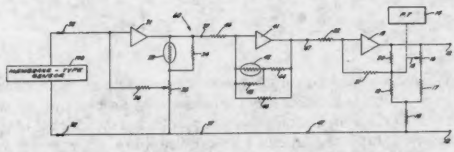
a tantalum nitride film resistor in which the temperature coefficient becomes zero in the plateau of characteristics may be obtained.

3,663,409

PRESSURE COMPENSATION OF MEMBRANE-TYPE SENSORS

Malbone W. Greene, Covina, Calif., assignor to Beckman Instruments, Inc.

Filed May 14, 1970, Ser. No. 37,267
Int. Cl. G01n 27/30
U.S. Cl. 204—195 P 14 Claims



In a sensor for measuring the quantity of a substance in a composition of matter of the type including a membrane which is permeable to the substance and substantially impermeable to liquid and ions, the permeability of the membrane being a function of the pressure thereon, the sensor providing an electrical output signal which is a function of the quantity of the substance in the composition of matter, there is disclosed an improvement consisting of a method and means for accurately compensating the output of the sensor for the effect of pressure upon membrane permeability by multiplying the output signal by the function e^{kp} thus cancelling the pressure effect which is given by the function P_0e^{-kp} where P_0=membrane permeability at zero pressure, p=absolute pressure, and k=a membrane constant. According to a preferred embodiment of the invention, such multiplication is achieved through the use of a pressure-driven, variable resistance in the feed-back loop of an operational amplifier.

3,663,410

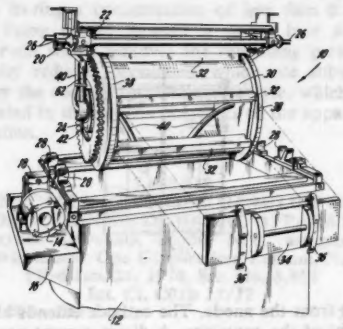
CONVERSION KIT FOR ELECTROPLATING APPARATUS

Walter Schumacher, Valley Stream, N.Y., assignor to Alberts Plating Works, Inc., Brooklyn, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,631
Int. Cl. C23b 5/78
U.S. Cl. 204—213 3 Claims

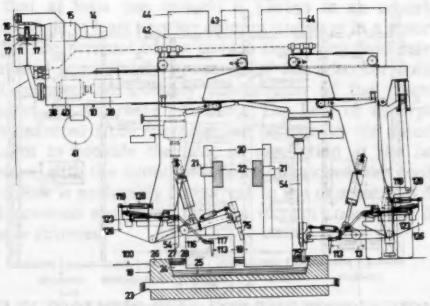
Means are provided for using a single electroplating barrel with either disc type or dangler type plating cathode conductors. A bearing ring assembly that is permanently secured to each transverse end wall of the electroplating barrel is used with both types of cathodes. When using the dangler type cathode conductor, nylon bearing means and a Teflon washer and bearing ring are inserted into

each bearing ring assembly and a dangler is then passed through each bearing ring from a position external of the barrel to terminate inwardly of the barrel in the usual manner. When using the disc type cathode conductors,



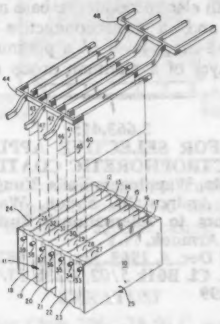
suitable rubber sealing rings and Teflon bushings are used in conjunction with a metallic bearing stud shaft that extends outwardly of the drum and which terminates in the conventional hanger bearing assembly.

3,663,411
MOBILE FURNACE MANIPULATOR
Kurt Springer, Rheinfelden, Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland
Filed Oct. 22, 1970, Ser. No. 83,045
Claims priority, application Switzerland, Oct. 24, 1969, 15,878/69
Int. Cl. C22d *3/02, 3/12*
U.S. Cl. 204—243 R **3 Claims**



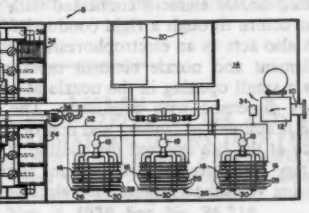
A travelling furnace manipulator for breaking up the slag crust in an aluminum melt electrolysis cell having a cell rim, an anode spaced across the cell from the rim, and a device for feeding alumina to the cell, a chisel device for breaking the crust, first and second scrapping devices arranged respectively in front of and behind the chisel device when looking in the direction of movement of the manipulator, and an arrangement for moving the first scraping device in front of the chisel device so as to pull an alumina cover on the slag in the cell toward the cell rim, and another arrangement for moving the second scraping device behind the chisel device so as to spread the alumina cover in the direction toward the anode.

3,663,412
ELECTROLYTIC CELL
Edward E. Kling and James L. Cousino, Muskegon, Mich., and James A. Frens, Houma, La., assignors to Lakeway Chemicals, Inc., Muskegon, Mich.
Filed June 12, 1970, Ser. No. 45,790
Int. Cl. B01k *3/10*
U.S. Cl. 204—257 **9 Claims**



An electrolytic cell comprises a cast U-shaped frame, a separator membrane mounted within said frame, and a pair endplates coextensive with the frame and together with a separator membrane defining elongated electrolyte compartments. An electrode is situated within each of the compartments, and a duct is provided within the frame communicating with the electrolyte compartment. Preferably, a portion of the separator membrane edge mounted within the frame is covered with a resilient material such as polytetrafluoroethylene. The cell is manufactured by casting the frame about a membrane, solidifying the cast frame, and thereafter welding the coextensive endplates on the frame.

3,663,413
DEVICE FOR ELECTROLYTICALLY INDUCING FLOCCULATION FOR WATER TREATMENT PLANTS
Anthony R. Marmo, Cheswick, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Feb. 6, 1970, Ser. No. 9,375
Int. Cl. B01k *3/00*
U.S. Cl. 204—275 **4 Claims**



A device for artificially inducing flocculation to aid in sewage treatment processes; which device comprises sacrificial electrodes suspended in an aeration tank above the air diffusers. The electrodes produce metallic hydroxides in solution which act as flocculating agents on sewage particles. The air diffusers act to keep the electrodes clean and to mix the metallic hydroxides with the sewage particles.

3,663,414
ELECTRODE COATING

Aleksandrs Martinsons, Wadsworth, and Bernard J. De Witt, Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

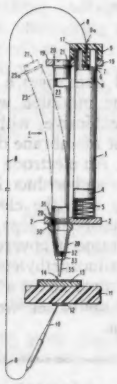
No Drawing. Filed June 27, 1969, Ser. No. 837,372
Int. Cl. B01k *3/04*; B44d *1/02*
U.S. Cl. 204—290 F 11 Claims

The novel anode may be used in the electrolysis of an aqueous solution such as of alkali metal chloride. The anode includes an electroconductive base member, typically of titanium, and an electroconductive coating or surface including an inner layer of a platinum group metal and an outer layer of a platinum group metal oxide.

3,663,415
APPARATUS FOR SELECTIVE APPLICATION OF ELECTROPHORETIC COATINGS

Lucien V. Auletta, Wappingers Falls, Yungil Kim, Poughkeepsie, and Andrew M. Simon, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1969, Ser. No. 882,070
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—299 10 Claims



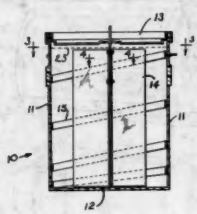
Electrophoretic coatings are formed selectively upon surfaces receptive to coating. The coating suspension is extruded in a small viscous mass at the selected surface site and a coating deposit is formed from the the mass by electrophoresis. A hand tool devised for this purpose includes a resiliently deformable hand manipulatable vessel assembly having a capped filler opening for receiving supplies of the coating suspension fluid and a dispensing duct for extruding the suspension. The duct includes a flexible insulated nozzle element connected with the main reservoir structure through a rigid conductive tubular element which also acts as an electrophoresis electrode. The tubular element and nozzle element taper progressively towards a small opening in the nozzle at which the coating fluid is dispensed with capillarity. The opening in the nozzle is adapted to contact and conform to the receptive surface at the site selected for coating. The tool includes a battery compartment and external connection lead for supplying voltage to generate the electrophoretic deposits.

3,663,416
SILVER RECOVERY DEVICE FOR PHOTO FIXER SOLUTIONS

Robert J. Cooper and Victor V. Carnell, Spokane, Wash., assignors to Noble Metals, Inc.

Filed Sept. 4, 1970, Ser. No. 69,572
Int. Cl. B01k *3/04*
U.S. Cl. 204—272 4 Claims

A plastic cylindrical container having a removable top lid which is adapted to receive a quantity of used photographic solution. An anode strip extends in a spiral configuration abutting the inside walls of the container. The anode comprises a plurality of turns which decrease in axial spacing from top to bottom along the container walls. A central cathode in the form of a flexible blade is suspended from the center of the container cover and

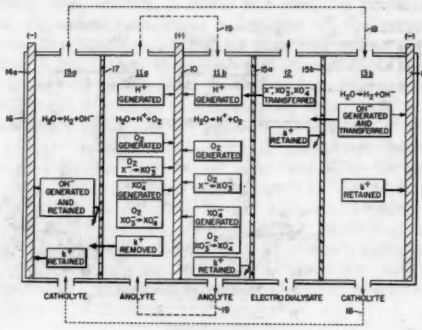


is spaced from the anode. The cathode extends along the full height of the container. A direct current power supply is connected to the anode through the top container wall and through the cover to the cathode. Recovered silver is removed from the cathode by flexing the blade surfaces slightly.

3,663,417
PER(HALO-OXYGEN) ACID OXIDATION, PURIFICATION AND RECOVERY APPARATUS

Allyn Harold Heit, 14 Thornton Place, Mount Holly, N.J. 08060, and James Norris Williamson, 7 Birch Lane, Marlton, N.J. 08053

Original application Apr. 8, 1968, Ser. No. 719,361. Divided and this application Oct. 7, 1970, Ser. No. 78,989
Int. Cl. B01d *13/02*
U.S. Cl. 204—301 17 Claims



An electrodialytic apparatus utilizing anion and cation permselective membranes and having at least one two-chamber cell for purification and at least one three-chamber cell proximal the two-chamber unit for concentration of aqueous per(halo-oxygen) acids and their salts, all anolyte chambers sharing a common anolyte stream, all catholyte chambers sharing a common catholyte stream, and at least one of the anolyte chambers of the purification and the concentration cells sharing a common anode. A multi-step process for recovering and regenerating the periodate oxidant used in preparing oxidized polysaccharides in which the primary liquor and subsequent wash liquors from the oxidized polysaccharide filter cake are

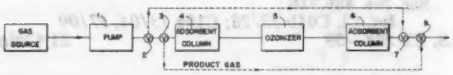
circulated in the anolyte and middle chambers of the electrodialytic apparatus having two-chamber and three-chamber cells for re-oxidation and concentration respectively, the liquors having a concentration of 1 to 15 weight percent being circulated in the anolyte chambers; those liquors having a concentration of 0.5 to 5 weight percent being circulated in the middle chamber, all liquors and effluents having a concentration of less than 0.5 weight percent being passed through a strong base anion exchange resin which removes the remaining periodate or chemically reduced periodates, which are subsequently eluted by the sodium hydroxide catholyte, which in turn is circulated in the anolyte chambers of the apparatus for regeneration.

3,663,418

PERIODICALLY REVERSED GAS FLOW OZONE PRODUCTION METHOD AND APPARATUS

Masayuki Kawahata, Scotia, N.Y., assignor to Environment/One Corporation, Latham, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,853
Int. Cl. C01b *13/12*
U.S. Cl. 204—314 **7 Claims**



A periodically reverse gas flow method and apparatus for ozone production is described. Because moisture reduces the efficiency of most ozonizers, moisture is removed from an oxygen containing fluid before it passes through the ozonizer and the moisture is returned to the oxygen and ozone containing fluid after the ozonizer. At least two moisture adsorbent material columns are used so that the oxygen containing fluid is first passed serially through the two columns with the ozonizer interposed and then periodically reversed to pass serially through the three components in the opposite direction so that at least one column is always in an adsorbent cycle while at least another column is always in a desorber cycle. The pressure of the oxygen containing fluid may be increased immediately upstream of the adsorber column and reduced immediately downstream of the adsorber column, for increased efficiency. The heat of adsorption is transferred from the adsorber column to the desorber column to provide the heat of desorption at the latter column, with the ozonizer serially interposed; the coolant fluid flow is preferably co-current to the oxygen fluid flow and reversed everytime that the oxygen containing fluid flow is reversed.

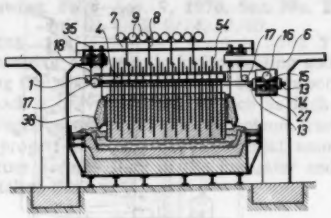
3,663,419

ELECTROLYTIC CELL FOR THE PRODUCTION OF ALUMINUM

Mihaly Toth and Jozsef Imreffi, Budapest, Hungary, assignors to Alutero Aluminiumipari Tervezo Vallatat, Budapest, Hungary

Filed Sept. 10, 1969, Ser. No. 856,533
Int. Cl. B01k *3/00*; C22d *3/02*; C23b *5/70*
U.S. Cl. 204—225 **12 Claims**

An electrolytic cell for the production of aluminum comprises a plurality of anodes in a self-coking carbonaceous anode mass that is progressively lowered into the bath. The anodes have flattened upper ends whose greatest width is greater than the width of the lower portions of the anodes; and the anodes are suspended by clamping the narrow edges of these flattened upper ends, so that the anodes can be inserted and removed by rotating them a quarter turn about their axes. The anodes are arranged in special patterns relative to each other. The anode mass is vertically movable by a special mechanism, and is encased in an aluminum sheath secured thereto



which in turn is surrounded by an insulating casing of special construction, with powdered alumina fed downwardly between the sheath and the casing.

ERRATUM

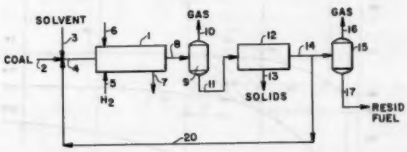
For Class 206—19.50 C see:
Patent No. 3,663,432

3,663,420

COAL PROCESSING

Harry E. Jacobs, Glenwood, Ill., and George R. Worrell, Media, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Oct. 14, 1970, Ser. No. 80,673
Int. Cl. C10g *1/04*
U.S. Cl. 208—8 **6 Claims**



A method for forming a low sulfur residual fuel oil from a high sulfur coal comprising hydrogenating the coal in the absence of externally supplied contact particles and at an elevated temperature, followed by separating solid particles from the liquefied coal at an elevated temperature.

3,663,421

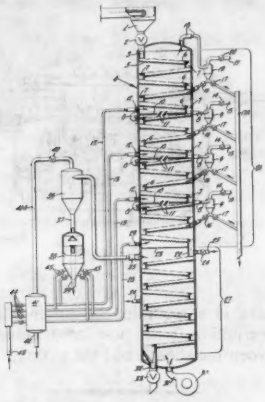
CONTINUOUS, FLUIDIZED PROCESS AND SYSTEM FOR THERMAL RECOVERY OF HYDROCARBONACEOUS MATERIALS FROM SOLIDS

George E. Parr, West Chester, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Filed Nov. 4, 1970, Ser. No. 86,710
Int. Cl. C10b *53/06*
U.S. Cl. 208—8 **5 Claims**

The invention relates to a new process and apparatus for the thermal recovery of valuable liquid and gaseous hydrocarbon products from hydrocarbonaceous materials. The process is conducted within a vessel which has contiguous thermal treatment zones and spent solids combustion zones separated by a gas seal; the thermal treatment zone is characterized by maintaining a fluidized bed of the hydrocarbonaceous material on shallow-bed con-

catenated, slanting trays; a plurality of sidestream outlets to remove condensable hydrocarbon products and a plu-



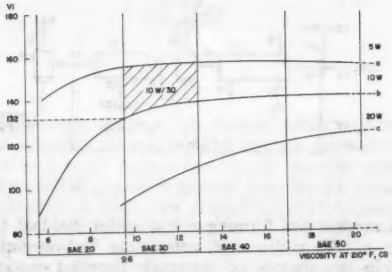
rality of hot gas inlets which serves to maintain fluidization and give temperature control.

3,663,422

PROCESS FOR THE PRODUCTION OF VERY HIGH VI LUBRICATING OILS BY HYDROTREATING

Peter W. Dun and Formijn J. van Hemert, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Aug. 28, 1969, Ser. No. 853,719
Claims priority, application Great Britain, Sept. 5, 1968, 42,311/68
Int. Cl. C10g *41/00*
U.S. Cl. 208—28 **5 Claims**



Very high viscosity index (VI >125) lubricating oils are produced by hydrotreating solvent-refined, asphalt-free waxy hydrocarbons in the presence of a suitable catalyst under specific hydrotreating conditions. A true SAE 10W/30 multigrade oil is produced which does not require the addition of VI improves or thickeners.

3,663,423

PRODUCTION OF LUBRICATING OILS

Robert Neil Bennett, Ashford, Richard Nigel Parker, Middlesex, and Bernard Whiting Burbidge, Surrey, England, assignors to The British Petroleum Company Limited, London, England

No Drawing. Filed Mar. 14, 1969, Ser. No. 807,401
Claims priority, application Great Britain, Mar. 22, 1968, 13,889/68
Int. Cl. C10g *13/02, 37/02*
U.S. Cl. 208—59 **6 Claims**

A wholly catalytic route for the production of lubricating oils for petroleum feedstocks boiling above 350° C. comprises the steps of VI improvement over a catalyst of a Group VI*a* and/or Group VIII metal on a refractory oxide support and catalytic dewaxing over a catalyst of a Group VI*a* and/or Group VIII metal on low alkali metal content mordenite. The steps may be in either order but the VI improvement step is preferably first.

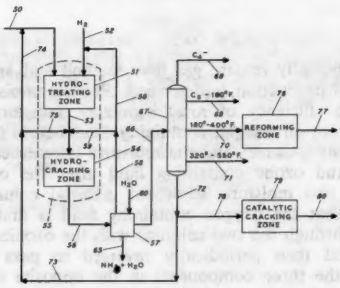
The VI improvement step is at 650–850° F. and 1000–3000 p.s.i.g. using preferably, Co-Mo or silica alumina and the catalytic dewaxing step is at 450–950° F. and 100–3000 p.s.i.g. using, preferably, Pt on decationised mordenite having a SiO_2:Al_2O_3 ratio of 14:1–50:1. Depending on the feedstock to and the severity of the VI improvement step, lubricating oil product fractions of either high (75–100) or super high (100–140) VI may be produced.

3,663,424

HYDROTREATING CATALYST COMPRISING AN INTERSTRATIFIED CRYSTALLINE CLAY-TYPE ALUMINOSILICATE COMPONENT AND A CRYSTALLINE ZEOLITIC MOLECULAR SIEVE COMPONENT, AND PROCESS USING SAID CATALYST

Joseph Jaffe, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 750,283, Aug. 5, 1968. This application Dec. 19, 1969, Ser. No. 886,726
Int. Cl. C01b *33/28*; C10g *13/04, 37/00*
U.S. Cl. 208—59 **21 Claims**



A catalyst comprising an interstratified synthetic crystalline aluminosilicate cracking component and a crystalline zeolitic molecular sieve component, which may be dispersed in a matrix comprising a siliceous gel, if desired one or both of said components being substantially in the ammonium or hydrogen form and substantially free of any catalytic metal or metals when dispersed in a matrix, and if desired one of said components being substantially in the ammonium or hydrogen form and substantially free of any catalytic metal or metals when not dispersed in a matrix, and at least one hydrogenating component selected from rhenium and compounds thereof and Group VIII metals and compounds thereof, and processes using said catalyst.

3,663,425

GASOLINE PRODUCING PROCESS COMPRISING HYDROCRACKING AND REFORMING

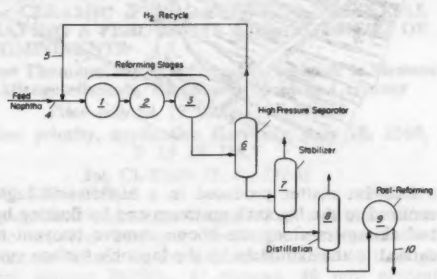
Ernest L. Pollitzer, Skokie, and Lee Hilfman, Prospect Heights, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Sept. 16, 1969, Ser. No. 858,510
Int. Cl. C10g *37/10*
U.S. Cl. 208—60 **7 Claims**

A combination process involving hydrocracking and dehydrogenation. Hydrocracking of a heavier-than-gasoline charge stock is effected at conditions conducive to aromatic saturation and extended catalyst stability. Dehydrogenation of at least a portion of the hydrocracked

product effluent is effected at conditions which are conducive to the conversion of naphthenes to aromatics. The hydrocracking reaction is effected at high pressures and high space velocities, while the dehydrogenation reaction is effected at lower pressures and lower space velocities.

3,663,426
UPGRADING OF REFORMATE WITH A TELLURIUM-FAUJASITE CATALYST
Richard J. Mikovsky, Trenton, N.J., Anthony J. Silvestri, Morrisville, Pa., and Robert L. Smith, Hopewell, N.J., assignors to Mobil Oil Corporation
Filed Nov. 14, 1969, Ser. No. 876,624
Int. Cl. C10g *39/00*
U.S. Cl. 208—65 **9 Claims**



Naphtha is reformed over a noble metal catalyst to effect a desired degree of naphthene aromatization and then subjected to a post-reforming step in which paraffins in the reformate are aromatized over a dehydrocyclization catalyst.

3,663,427
PREPARATION OF LUBE HYDROCRACKING STOCKS
Jeffrey R. Thomas, Claymont, and Ib Steinmetz, Wilmington, Del., assignors to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Oct. 6, 1970, Ser. No. 78,629
Int. Cl. C10m *1/04*
U.S. Cl. 208—87 **8 Claims**

A process for preparing high V.I. lube oils of high quality in improved yield comprising fractionating the stock material into three fractions, boiling at (a) from 720–855° F., (b) 855 to 980° F. and (c) the residuum or a fraction boiling at from 986–1070° F., solvent extracting fraction (b) with a solvent having preferential solubility for aromatics such as furfural, recombining the three fractions, and hydrocracking the combined fractions at from 720 to 800° F. using a hydrogen partial pressure of from 2,000 to 3,000 p.s.i. The higher boiling fraction is deasphalted if required.

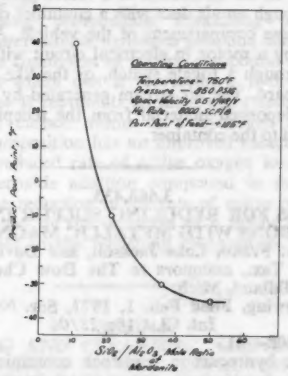
3,663,428
PROCESS FOR PRODUCING ALKYLATED TARS
Masaaki Takahashi, Tokyo, and Osamu Mayumi, Chiba, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
No Drawing. Filed Feb. 16, 1970, Ser. No. 11,904
Claims priority, application Japan, Feb. 14, 1969, 44/10,488
Int. Cl. C10g *37/00*
U.S. Cl. 208—97 **5 Claims**

A process for the production of alkylated tars comprising reacting a lower olefin, in the presence of a silica-alumina or zeolite type catalyst, with a tar fraction obtained by the thermal decomposition of a petroleum hydrocarbon at 700–2300° C., and if desired, following a desulfurization reaction.

3,663,429
PROCESS FOR HYDROCONVERSION OF RAW SHALE OIL
Barney Vallino, Homewood, Ill., assignor to Atlantic Richfield Company, New York, N.Y.
No Drawing. Filed Apr. 9, 1970, Ser. No. 27,126
Int. Cl. C10g *9/14, 13/00*
U.S. Cl. 208—108 **7 Claims**

The process of catalytically hydrogenating and/or hydrocracking raw shale oil is improved by incorporating in the feedstock a heavy mineral oil such as high boiling shale oil fractions and high boiling petroleum fractions of desirable properties to prevent substantial amounts of deposits from accumulating in the preheater and in the reactor catalyst bed.

3,663,430
HYDROCARBON DEWAXING WITH A MORDENITE-TYPE ALUMINO-SILICATE
Herbert C. Morris, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.
Filed Dec. 22, 1967, Ser. No. 692,818
Int. Cl. B01j *11/40*; C08g *13/02, 41/00*; C01b *33/28*
U.S. Cl. 208—111 **18 Claims**

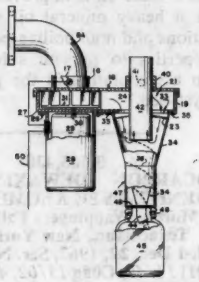


Hydrocarbon feedstocks containing wax-like materials are dewaxed in the presence of a mordenite-type crystalline alumino-silicate in hydrogen form having a silica to alumina mole ratio greater than about 10 to 1. A catalytic material, containing either a Group VIII or a Group VI–B metal, associated with the zeolite provides increased activity and longer catalyst life.

3,663,431
TWO-PHASE HYDROCARBON CONVERSION SYSTEM
Robert E. Wagner, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Filed Oct. 15, 1969, Ser. No. 866,764
Int. Cl. C10g *23/02*
U.S. Cl. 208—143 **21 Claims**

Hydrocarbons are hydrocracked, hydrofined, hydrogenated and/or demetallized by intimate contacting at elevated temperatures in the presence of hydrogen with an aqueous dispersion of a sulfide of molybdenum, vanadium and/or rhenium. The catalytically active components are conveniently produced in the aqueous phase by reduction and/or sulfurization of the corresponding water soluble sulfides, oxides, acids or salts. These methods are particularly attractive for the selective demetallization and molecular weight reduction and/or removal of asphaltenes and resins.

3,663,432
SELF-CLEANING ASH TRAY FOR VEHICLES AND THE LIKE
Lloyd H. Ellison, 2735 NW. Coolidge Way, Corvallis, Oreg. 97330
Filed Aug. 14, 1970, Ser. No. 63,797
Int. Cl. C65d *3/08*
U.S. Cl. 206—19.5 C 3 Claims



A receptacle for cigar and cigarette stubs, ashes, and similar waste material. The receptacle is accessible through a doorway in the dashboard of a vehicle and in communication through an air duct with a container disposed within the engine compartment of the vehicle. A suction fan is driven by a motor in electrical circuit with the vehicle battery through a toggle switch, or the like, mounted on the dashboard. The air stream generated by the fan conveys the deposited material from the receptacle through the air duct to the container.

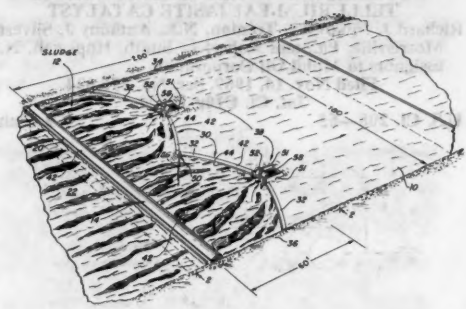
3,663,433
PROCESS FOR REDUCING SULFUR IN HYDROCARBONS WITH METALLIC MAGNESIUM
Edward A. Fraini, Lake Jackson, and David E. Minter, Austin, Tex., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Feb. 1, 1971, Ser. No. 113,031
Int. Cl. C10g *23/06*
U.S. Cl. 208—213 7 Claims

A crude hydrocarbon feedstock containing sulfur impurities is desulfurized, i.e. reduced in sulfur content, by reacting the feedstock in a hydrogen atmosphere with finely divided magnesium at a high temperature and pressure. The feedstock is then separated from the magnesium sulfide. Sulfur can be recovered from the magnesium sulfide and the magnesium recycled if desired.

3,663,434
DESULFURIZATION
Alan G. Bridge, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Continuation-in-part of application Ser. No. 743,568, July 9,1968, which is a continuation-in-part of application Ser. No. 688,046, Sept. 15, 1967. This application Jan. 12, 1970, Ser. No. 2,097
The portion of the term of the patent subsequent to Feb. 17, 1987, has been disclaimed
Int. Cl. C10g *23/02*
U.S. Cl. 208—210 8 Claims

A process for hydrodesulfurization of a heavy oil containing iron as an organometallic compound, which comprises: (a) passing the heavy oil at an elevated temperature, together with hydrogen, through a first fixed catalyst bed which has increasing catalytic hydrogenation activity along the normal direction of feed flow through the first bed; and (b) passing at least a portion of the effluent from the first bed, at an elevated temperature and pressure, and in the presence of hydrogen, through a second fixed bed containing sulfactive catalyst particles having a surface are of at least 100 $m.^2/g.$

3,663,435
WATER PURIFICATION PROCESS
James F. Grutsch and George C. Flood, Hammond, Ind., assignors to Standard Oil Company, Chicago, Ill.
Continuation of application Ser. No. 824,781, May 15, 1969. This application Aug. 5, 1970, Ser. No. 61,419
Int. Cl. B03d *1/00*
U.S. Cl. 210—44 1 Claim



Buoyant matter produced in a bioflotation lagoon is confined to the lagoon's upstream end by floating booms, and skimmers along the booms remove buoyant matter carried to the skimmers by the lagoon's surface currents.

3,663,436
LUBRICATING GREASES
William D. Carswell, Chester, England, assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed June 27, 1968, Ser. No. 740,487
Claims priority, application Great Britain, July 13, 1967, 32,205/67
Int. Cl. C10m *3/26*
U.S. Cl. 252—28 6 Claims

Copper corrosion resistant greases are obtained by incorporating therein a minor amount of a 3-amino-1,2,4-triazole.

3,663,437
SEMI-FLUID LUBRICANT COMPOSITIONS
Howard D. Moore, Ernest L. Padmore, and John Whittle, Cheshire, England, assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed Nov. 19, 1969, Ser. No. 878,216
Claims priority, application Great Britain, Nov. 20, 1968, 55,000/68
Int. Cl. C10m *7/36*
U.S. Cl. 252—28 3 Claims

Lubricant compositions comprising a synthetic base fluid of a polyoxy-alkylene compound gelled to a semi-fluid consistency, having a penetration value within the range of about 350 to about 450, reduce lubricant loss from imperfect gear-box seals etc. and possess good oxidation and good slip properties.

3,663,438
HIGH TEMPERATURE GREASE COMPOSITIONS
Joshua D. Smith, New Orleans, and Marion A. Clifton, Holson, La., assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed June 23, 1969, Ser. No. 835,725
Int. Cl. C10m *5/22*
U.S. Cl. 252—28 9 Claims

Grease compositions comprising a mineral lubricating oil thickened to grease consistency having incorporated therein minor amounts each of a phenothiazine-type inhibitor and a polyester of a C_{1-20} alcohol and a C_{3-20} carboxylic acid, have improved high speed, high temperature lubricating properties.

3,663,439

LUBRICANT COMPOSITIONS

Gerassimos Frangatos, Westmont, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed June 25, 1970, Ser. No. 49,939
Int. Cl. C10m *1/44*
U.S. Cl. 252—49.9 10 Claims

The oxidation and extreme pressure properties of lubricating oils are improved by adding thereto a compound prepared from cetyl vinyl ether and N-vinylpyrrolidone in the presence of a trihydrocarbyl phosphite.

3,663,440

PIEZOELECTRIC STRUCTURE COMPOSED OF A CERAMIC FERRO-ELECTRIC MATERIAL HAVING A PEROVSKITE ARRANGEMENT OF COMPONENTS

Helmut Thomann, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 24, 1970, Ser. No. 58,098
Claims priority, application Germany, July 28, 1969, P 19 38 318.7
Int. Cl. C04b *35/46, 35/48*
U.S. Cl. 252—62.9 7 Claims

A piezoelectric structure comprised of a ceramic ferroelectric material having a Perovskite arrangement of components defined by the general formula: 41 through 49 mol percent $PbTiO_3$, 37 through 49 mol percent $PbZrO_3$ and 5 through 18 mol percent $Pb(A_nB_m)O_3$, wherein A and B are both individual and distinct chemical elements, each having a positive valence and *n* and *m* are positive numerals, the sum of which equals 1 and the sum of the product of the valence A^xn plus the product of the valence of B^xm is equal to 4. For example, a preferred Perovskite arrangement for a preferred ferroelectric material is

$$xPbTiO_3—yPbZrO_3—zPb(Mg_{0.5}W_{0.5})O_3$$

wherein *x*, *y* and *z* are numerals the sum of which is equal to 1. The ferro-electric material also includes about 1% of MnO_2 and 0.15% Al_2O_3 by weight of all of the components. The disclosed structure has an improved electro-mechanical coupling factor *k*, an improved mechanical quality factor Q and an increased dielectric ε-value factor, all of which factors are selectively adjustable by selection of individual components and their amounts.

3,663,441

PREPARING ALUMINUM ALLOYS FOR FINISHING

Michael Gulla, Newton, Mass., assignor to Shipley Company, Inc., Newton, Mass.

Application Dec. 18, 1967, Ser. No. 691,256, now Patent No. 3,551,122, dated Dec. 29, 1970, which is a continuation-in-part of application Ser. No. 675,425, Oct. 16, 1967, now Patent No. 3,565,771. Divided and this application Aug. 5, 1970, Ser. No. 61,420
Int. Cl. C23g *1/18;* C23d *3/00*
U.S. Cl. 252—79.4 10 Claims

A composition for preparing an aluminum alloy containing at least 0.1 percent silicon for finishing. The composition is characterized by its ability to dissolve aluminum from the surface of the alloy leaving silicon and other insoluble alloying metals behind as a normally, visible, adherent coating resistant to oxidation and highly receptive to finishing operations such as metal plating, painting and the like.

3,663,442

HOUSEHOLD BLEACH HAVING STABLE OPACIFIER

Benjamin R. Briggs, Los Alamitos, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.

No Drawing. Filed Feb. 9, 1970, Ser. No. 9,966
Int. Cl. C11d *7/54*
U.S. Cl. 252—95 19 Claims

Liquid household bleach having visual opacity is provided by the incorporation into the bleach of a certain styrene-vinyl acid-vinyl sulfonate terpolymer latex which is highly resistant to deterioration in the bleach. The latex is prepared by introduction of styrene monomer into a preformed aqueous solution of the vinyl acid and vinyl sulfonate and a noncationic surfactant.

3,663,443

BLEACHING COMPOSITION

Dominique Du Bois, Amiens, France, Jorgen Heino, London, England, and Alan Frank Walden, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Nov. 20, 1969, Ser. No. 878,577
Claims priority, application France, Nov. 27, 1968, 175,556
Int. Cl. C11d *7/18, 7/56*
U.S. Cl. 252—99 10 Claims

A bleaching composition containing a builder, detergent, water-soluble hydrogen peroxide addition compound, and a copolymer of a vinyl compound of formula RCH=CHR where one R represents a hydrogen atom and the other R represents an alkyl ether radical having one to four carbon atoms or a hydrogen atom. The bleaching composition has an improved bleaching action due to the reduced rate of active oxygen loss from the hydrogen peroxide addition compound in the aqueous solution. The reduction in the rate of active oxygen loss is accomplished by the inclusion of a minor amount of the copolymer in the bleaching composition.

3,663,444

WASHING AND CLEANSING AGENTS WITH POLYAMIDES HAVING IMPROVED DIRT-CARRYING CAPACITY

Edmund Schmadel, Mettmann, Germany, assignor to Henkel & Cie GmbH, Dusseldorf, Germany

No Drawing. Filed Apr. 29, 1970, Ser. No. 33,090
Claims priority, application Germany, May 2, 1969, P 19 22 450.1
Int. Cl. C11d *7/56*
U.S. Cl. 252—99 6 Claims

A washing and cleansing composition with improved dirt-carrying capacity consisting essentially of

(1) a surface-active detergent composition,

(2) from 0.1% to 20% by weight, based on the total solids, of a water-soluble or water-dispersible polyamide reaction product of (a) a polyalkyleneimine having an average molecular weight of from 300 to 6000 selected from the group consisting of polyethyleneimines and polypropyleneimines and (b) an organic polycarboxylic acid having from 2 to 10 carbon atoms selected fro mthe group consisting of oxalic acid, alkanedioic acids, alkanetrioci acids, alkenedioic acids, benzenedicarboxylic acids, benzenetricarboxylic acids, cyclohexanedicarboxylic acids, cyclohexanetricarboxylic acids, hydroxyalkanedioic acids, hydroxyalkanetrioic acids, polyoxyalkanedioic acids, polythioalkanedioic acids, polyaminoalkanedioic acids and polyaminoalkanetrioic acids, the molar ratio of alkyleneimine unit to organic polycarboxylic acid being from 100:1 to 5:1, and

(3) optionally a non-surface-active builder salt and a compound with an intensified cleaning action.

3,663,445
SURFACE CLEANING AND DEFATTING COMPOSITION

Horst Augustin and Siegfried Klussendorf, Mannheim, Germany, and Konrad Kofer, Vienna, Austria, assignors to Lever Brothers Company, New York, N.Y.

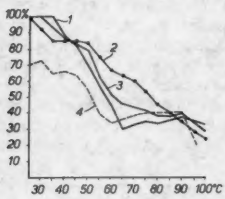
No Drawing. Continuation-in-part of application Ser. No. 805,966, Feb. 24, 1969, which is a continuation-in-part of application Ser. No. 537,282, Mar. 25, 1966. This application Aug. 22, 1969, Ser. No. 852,478
Int. Cl. C11d *9/30*
U.S. Cl. 252—117 6 Claims

Liquid storable concentrates and cleaning and defatting compositions, particularly for metal surfaces, prepared from said concentrates by dilution with water, wherein the concentrates comprise a nonionic surfactant, an alkanolamine salt of a fatty acid and an alkalolamine.

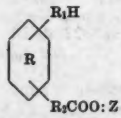
3,663,446
DETERGENT COMPOSITIONS WITH THERMO CONTROLLED FOAMING CAPACITY

Hans Barth, Kleve, Wilhelm Griess, Mannheim-Almenhof, Martin Knausenberger, Hockenheim, Henner Lange, Hamburg, Hans-Udo Menz, Schenefeld-Hamburg, and Angelos Sagredos, Hamburg, Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 19, 1968, Ser. No. 706,445
Claims priority, application Germany, Feb. 24, 1967, U 13,590
Int. Cl. C11d *3/065*
U.S. Cl. 252—539 3 Claims



Foaming at low washing temperatures is obtained without overfoaming at high temperatures. The thermo-controller is a substance of the general formula



in which R represents a carbon ring with, if desired, one or more double bonds, which may also be semicyclic; R_1 and R_2 are carbon chains, at least one of which, preferably R_2, is branched, and which are saturated or which may contain one or more double bonds, whereas R_1 and R_2 may also be zero. The ring system R may also carry further substituents. Z is a hydrogen atom or a salt-forming element or a salt-forming group.

3,663,447
COMPOSITION AND PROCESS FOR STRIPPING PAINT

Donald P. Murphy, Roseville, Mich., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Oct. 1, 1968, Ser. No. 764,291
Int. Cl. C11d *7/06*
U.S. Cl. 252—156 11 Claims

An aqueous alkaline stripping solution which contains an accelerator composition comprised of an alkylene glycol aryl ether and an organic nitrogen compound of the formula:

wherein R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen, alkanol and hydroxy ether groups, which latter groups contain from about 2 to 10 carbon atoms, at least one of R_1, R_2 and R_3 being other than hydrogen, the compound having a boiling point of at at least about 100 degrees C. and a molecular weight which is not substantially in excess of about 500. The preferred alkaline stripping solution is an aqueous sodium hydroxide solution and the preferred components of the activator composition are ethylene glycol monophenyl ether and triethanolamine.

3,663,448
INHIBITING SCALE DEPOSITION

Paul Hotchkiss Ralston, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 597,569, Nov. 29, 1966. This application Sept. 25, 1970, Ser. No. 75,706
Int. Cl. C02b *5/06;* C23f *14/02*
U.S. Cl. 252—180 9 Claims

A method of inhibiting scale formation in aqueous systems is disclosed, in which combinations of amino phosphonate compounds and water soluble polyacrylic acid derivatives are used.

3,663,449
MOLDING SYNTHETIC DETERGENT SUPERIOR IN MECHANICAL STRENGTH AND CONTAINERS MOLDED THEREFROM

Rinnosuke Susuki, Tokyo, Hiroshi Hoshi, Narashino-shi, and Jiro Saito and Kiyoshi Moriki, Tokyo, Japan, assignors to Raion Yushi Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1970, Ser. No. 33,470
Claims priority, application Japan, May 12, 1969, 44/36,426
Int. Cl. C11d *17/00*
U.S. Cl. 252—174 8 Claims

A synthetic detergent containing 25 to 95 percent sodium silicate, which has been limited to the order of 1 percent or at most over 10 percent for technical reasons, and a small amount of polyhydric alcohol such as glycerine or ethylene glycol is molded in the same manner as synthetic resins so as to make a container. Various containers such as for washing or detergent can be made of detergent itself.

3,663,450
ALPHA OLEFIN AND DIENE POLYMERIZATION CATALYST

Charles Cozewith, Westfield, and Erik G .M. Tornqvist, Roselle, N.J., assignors to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 694,051, Dec. 28, 1967. This application Dec. 23, 1969, Ser. No. 887,781
Int. Cl. C08d *1/14*
U.S. Cl. 252—429 B 5 Claims

A Ziegler-type catalyst system for polymerizing alpha olefins and conjugated dienes comprising (a) a hydrocarbon soluble adduct of a titanium subhalide and a Lewis base, such as the methyl- and dimethyl-derivatives of

tetrahydrofuran and tetrahydrothiophene and (b) an organo aluminum compound, such as diethylaluminum chloride.

3,663,451
OLEFIN POLYMERIZATION CATALYSTS
Thomas Hill, Falkirk, Scotland, assignor to BP Chemicals Limited, London, England
No Drawing. Filed Jan. 30, 1970, Ser. No. 7,220
Claims priority, application Great Britain, Jan. 30, 1969, 5,195/69
Int. Cl. C07c *3/10*
U.S. Cl. 252—431 R 18 Claims

Olefin oligomerization and polymerization catalyst containing (a) transition metal bonded to a carrier and a ligand and (b) an aluminium alkyl. A typical embodiment is the combination of (a) nickel bonded to silica, alumina or silica/alumina and acetylacetone and (b) aluminumtriethyl.

3,663,452
HYDROGENATION CATALYST
Thomas E. Kiovsky, El Sobrante, and Milton M. Wald, Walnut Creek, Calif., assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed May 15, 1970, Ser. No. 37,912
Int. Cl. B01j *11/82*
U.S. Cl. 252—438 4 Claims

A catalyst for increasing the rate of hydrogenation reactions including a complex salt of the chloride, bromide or iodide of zinc, tin, antimony, bismuth, cadmium, gallium, mercury or arsenic, and the corresponding ammonium halide.

3,663,453
SKELETAL ISOMERIZATION OF OLEFINS OVER HALOGEN-CONTAINING ZIRCONIA CATALYST
John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Apr. 20, 1970, Ser. No. 30,278
Int. Cl. B01j *11/78*
U.S. Cl. 252—441 6 Claims

A catalyst suitable for the skeletal isomerization of olefin hydrocarbons comprises zirconia promoted with at least one compound which is a halogen acid or an ammonia halide salt which has been activated by calcination at a temperature of from about 500° to about 1200° F.

3,663,454
ACTIVATION OF HYDROCARBON CATALYST USING SOLUTION
Robert M. Suggitt, Fishkill, and John H. Estes, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.
No Drawing. Filed June 15, 1967, Ser. No. 646,199
Int. Cl. B01j *11/78*
U.S. Cl. 252—442 8 Claims

This invention and this disclosure are directed to an improved method for activating alumina and noble metal-alumina composites to prepare catalysts useful for hydrocarbon conversion, particularly isomerization. The invention revolves about activating the composite with a solution of hexachloroethane or octachloropropane which are normally solids at ambient conditions. The activation of the alumina or metal-alumina composite is performed by introducing the hexachloroethane activating agent in the form of a solution and treating the composite to be activated with the solution under activating conditions. A suitable solvent is tetrachloroethylene.

3,663,455
METHOD OF PREPARING SUPPORTED OXIDATION CATALYSTS FOR PRODUCING ETHYLENE OXIDE
Benedetto Calcagno and Natale Ferlazzo, Milan, and Marcello Ghirga, Bresso, Italy, assignors to Società Italiana Resine S.p.A., Milan, Italy
No Drawing. Filed Nov. 19, 1969, Ser. No. 878,200
Claims priority, application Italy, Nov. 23, 1968, 24,087/68
Int. Cl. B01j *11/82*
U.S. Cl. 252—443 5 Claims

A method for preparing a supported catalyst for use in oxidizing ethylene to ethylene oxide, said supported catalyst consisting essentially of silver to the extent of 7 to 30% by weight with respect to the support, and of a member selected from the group consisting of platinum, palladium and gold to an extent of from 0.01 to 1.0% by weight with respect to said silver, which comprises:

(a) impregnating a solid, inert subdivided support, at a temperature of from 60° C. to 115° C., with a solution of silver lactate in lactic acid containing in suspension, carbon and at least one metal selected from the group consisting of palladium, platinum and gold, said lactic acid being present in a molar excess of from 20% to 200% with respect to the number of mols required for complete salification of said silver,

(b) drying the particles thus impregnated in a stream of air at a temperature rising to a maximum, but not exceeding 130° C. for a period of from 1 to 3 hours, and

(c) subjecting the particles thus impregnated to a heat treatment, said temperature being raised gradually to a maximum level of between 230° C. and 360° C. over a period of 10 to 15 hours.

3,663,456
ZEOLITE A SYNTHESIS
Lawrence L. Upson, Wallingford, Pa., and Ronald T. Wood, Wilmington, Del., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.
No Drawing. Filed Nov. 17, 1969, Ser. No. 877,440
Int. Cl. C01b *33/28*
U.S. Cl. 252—455 Z 2 Claims

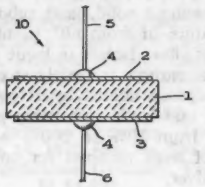
Kaolin is calcined at a severity sufficient to prepare amorphous de-exothermed kaolin substantially free from mullite. A mixture of about 4.3 parts of such de-exothermed kaolin and 1 part of alumina alpha trihydrate is prepared and dispersed in a sodium hydroxide solution at ambient temperature. The freshly prepared solution is heated to about 100° C. and maintained at hot aging conditions for from about 10 to about 20 hours, to prepare a product comprising significant amounts of Zeolite A in an aluminosilicate matrix.

3,663,457
METHOD OF PREPARING AN OXIDIZING CATALYST FOR THE EXHAUST GASES OF INTERNAL COMBUSTION ENGINES
Takaaki Tamura, Tokyo, Tsutomu Kato, Hamamatsu-shi, and Kazuyoshi Sakamoto, Fukuroi-shi, Japan, assignors to Kachita Co., Ltd., Hamamatsu-shi, Japan
No Drawing. Filed June 8, 1970, Ser. No. 44,650
Claims priority, application Japan, June 12, 1969, 44/45,763
Int. Cl. B01j *11/06, 11/22*
U.S. Cl. 252—463 4 Claims

A method of preparing a granular oxidizing catalyst useful in the conversion of carbon monoxide contained in the exhaust gases of internal combustion engines to harmless carbon dioxide which comprises the steps of mixing fine powders of high purity manganese dioxide, copper oxide, activated alumina and alumina cement together, kneading the mixed powders with water into a paste, form-

ing the paste into wet granules of suitable size, allowing the still wet granules to stand as they are over 24 hours to increase the hardness thereof and thermally drying them for natural solidification into a rigid form.

3,663,458
NONLINEAR RESISTORS OF BULK TYPE
Takeshi Masuyama, Michio Matsuoka, and Tsuyoshi Nishi, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sept. 27, 1968, Ser. No. 763,285
Claims priority, application Japan, Oct. 17, 1967, 42/67,389, 42/67,392, 42/67,393, 42/67,394, 42/67,395; Jan. 22, 1968, 43/4,192, 43/4,198; Feb. 12, 1968, 43/9,311; May 10, 1968, 43/31,772, 43/31,773
Int. Cl. H01b *1/06*
U.S. Cl. 252—518 **5 Claims**



A nonlinear resistor wherein the nonlinearity is due to the bulk thereof and which has a high *n*-value comprises a sintered body of a composition comprising ZnO and 0.05 to 10.0 mole of Bi_2O_3. Such a nonlinear resistor has nonohmic resistance due to the bulk itself, and the C-value can be changed without impairing the *n*-value. Ohmic electrodes are applied to opposite surfaces of the sintered body. The presence of other specified oxides tends to raise the *n*-value.

3,663,459
DETERGENT BAR
Ryonosuke Yoshida and Masahiro Takehara, Kanagawaken, Hitoshi Akiba, Saitama-ken, and Yasunori Usuba, Tokyo, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
No Drawing. Filed Feb. 25, 1970, Ser. No. 14,202
Claims priority, application Japan, Mar. 7, 1969, 44/17,040
Int. Cl. C11d *17/00, 3/32*
U.S. Cl. 252—546 **3 Claims**

The water soluble salts of N-acyl-glutamic acids and N-acylaspartic acids whose acyl groups are the acyl radicals of saturated or unsaturated fatty acids having 8 to 22 carbon atoms with the alkali metals, ammonium, basic amino acids, and other amines can be milled with water and molded into bars by procedures conventional in the making of milled toilet soaps, and have desirable properties as detergents for toilet use.

ERRATA

For Classes 252—301 thru 252—431 see: Patent Nos. 3,663,473 thru 3,663,480

3,663,460
CHROMIUM(III) AND IRON(III) HYDROXY BIS(PHOSPHINATE) AND BIS(ARSINATE) POLYMERS
Burton Peter Block, Wayne, Piero Luigi Nannelli, King of Prussia, Hyman David Gillman, Norristown, and Paula Marion Thomas, King of Prussia, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.
No Drawing. Filed Apr. 27, 1970, Ser. No. 32,351
Int. Cl. C08g *33/16, 33/20*
U.S. Cl. 260—2 P **6 Claims**

Chromium(III) and iron(III) hydroxy bis(phosphinate) and bis(arsinate) polymers composed of the recurring unit $[Z(OH)(OMRR'O)_2]$, where Z is chromium or iron in the trivalent state, M is phosphorus or arsenic, and R and R' are inert organic groups, are useful as corrosion proof coatings for metal which will be subjected to high temperature conditions.

3,663,461
CHAIN EXTENDED POLYELECTROLYTE SALTS AND THEIR USE IN FLOCCULATION PROCESSES
Edward Witt, Dover, Del., assignor to Standard Brands Chemical Industries, Inc., Dover, Del.
No Drawing. Continuation-in-part of application Ser. No. 763,977, Sept. 30, 1968. This application June 30, 1970, Ser. No. 51,344
Int. Cl. C08g *33/00, 33/06*
U.S. Cl. 260—2 BP **11 Claims**

Water-soluble poly(quaternary ammonium) polyether polyelectrolyte salts containing quaternary nitrogen atoms in the polymer backbone and chain-extended by ether groups are prepared by treating the polymeric reaction product from an N,N,N',N'-tetraalkyl-hydroxy substituted diamine and an organic dihalide such as a dihaloalkane or a dihalo ether with an epoxyhaloalkane. These polyelectrolytes are used in processes for flocculating particles dispersed in aqueous media, for example, white water clarification, clay flocculation, sewage treatment, and wet-end addition, by adding the polyelectrolyte to the aqueous media in amounts sufficient to flocculate the dispersed particles.

3,663,462
PREPARATION OF ACRYLATE FOAMS
Peter Joseph Arndt, Jugenheim, Herbert Fink, Bickenbach Ueber Darmstadt, Helmut Moroff, Trautheim, near Darmstadt, and Hermine Determann and Reinhard Grimm, Darmstadt, Germany, assignors to Rohm Gesellschaft mit beschrankter Haftung, Darmstadt, Germany
No Drawing. Filed Jan. 9, 1970, Ser. No. 1,871
Claims priority, application Germany, Jan. 16, 1969, P 19 02 076.9
Int. Cl. C08f *47/08, 37/06*
U.S. Cl. 260—2.5 L **10 Claims**

A method of making acrylate foams by dispersing a gas in an aqueous dispersion of an acrylate polymer comprising more than 50 percent by weight of an ester of acrylic or methacrylic acid, and then removing water from the mixture. The dispersion contains at least 55 percent by weight of solids having a critical average particle size and particle size distribution defined by the settling characteristics of the dispersion when centrifuged. Acrylate foams made by this method.

3,663,463
NONCOMBUSTIBLE AND FIREPROOFING POLYMER COMPOSITIONS AND PROCESS
Henry K. Wren, 8521 Lamira Lane, Indianapolis, Ind. 46234
No Drawing. Filed July 16, 1970, Ser. No. 55,589
Int. Cl. C08f *47/08;* C08j *1/22*
U.S. Cl. 260—2.5 FP **20 Claims**

Noncombustible and fireproofing polymer compositions are prepared by reacting via a condensation mechanism, a polyol, an organic anhydride, or an organic acid, and boric acid to form first an esterified material and then further condensing this first esterified material with both a nitrogenous spumific compound and a carbohydrate class compound to form the noncombustible and fireproofing polymer compositions. The polymer compositions may then be formed into noncombustible films, sheets, laminates or fibers, cast, extruded or otherwise formed into articles or may be incorporated into paints, lacquers, varnishes, plastics, rubbers, to yield these ma-

terials fireproof, and additionally may be coated alone or as a further composition on fibers, fabrics, wood, paper, cardboard, plastics, leather, wire and so on.

3,663,464

POLYMERIC VEHICLES AS CARRIERS FOR SULFONIC ACID SALT OF NITROSUBSTITUTED AROMATIC AMINES

Paul M. Sawko, San Jose, Calif., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

No Drawing. Filed Aug. 13, 1970, Ser. No. 63,610

Int. Cl. C08d *13/08*

U.S. Cl. 260—2.5 FP **7 Claims**

An intumescent agent is provided which contains the ammonium salt of 4-nitroaniline-2-sulfonic acid and a polymer of the mercaptan type which may contain disulfide linkages or polyoxyalkylene linkages. The adhesion and char resistance of such compositions can be further improved by the addition of epoxy resins.

3,663,465

PREPARATION OF OPEN-CELL POLYURETHANE FOAMS IN THE PRESENCE OF 2-SUBSTITUTED 1,1,3,3-TETRAALKYL GUANIDINES AND AN ACID

Adolf W. Fogiel, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 29, 1970, Ser. No. 6,965

Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 AC **16 Claims**

Open-cell, non-shrinking, flexible polyurethane foam prepared from an aliphatic polyisocyanate, a polyester polyol, and water in the presence of a 2-substituted-1,1,3,3-tetraalkyl guanidine as catalyst and an acid, said acid having a pKa of about 1–10 and being practically insoluble in diethyl ether; the addition of all the components being conducted in such a manner that contact between said acid and said catalyst is avoided prior to the mixing of all the components.

3,663,466

FOAMABLE THERMOPLASTIC POLYMER GRANULES AND METHOD FOR MAKING

Werner L. Jablonski, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 1, 1968, Ser. No. 749,287

Int. Cl. C08f *33/02, 47/10*

U.S. Cl. 260—2.5 B **10 Claims**

Foamable styrene polymers are prepared by incorporating within the particles an alkali metal salt of long chain or aromatic carboxylic acids. Improved fusion, low cooling time and anti-clumping properties are obtained.

3,663,467

POROUS POLYMERS BASED ON TRIMETHYLOLPROPANE TRIMETHACRYLATE AND RELATED MATERIALS

Robert L. Albright, Churchville, Pa., assignor to Rohm & Haas Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 756,392, Aug. 30, 1968. This application July 30, 1969, Ser. No. 846,271

Int. Cl. B01d *15/08;* **C08f** *29/46, 47/08*

U.S. Cl. 260—2.5 B **14 Claims**

Porous polymers are prepared by polymerization of a polyfunctional methacrylate such as trimethylolpropane trimethacrylate, either alone or in conjunction with other comonomers in the presence of a variety of phase separating solvents. These porous polymers are useful as adsorbants in both aqueous and non-aqueous media and, when ionic functional groups are incorporated into the resin structure, are also useful as ion exchange resins.

3,663,468

METHOD OF MAKING RIGID POLYURETHANE FOAMS

Loren A. Haluska, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Original application May 2, 1966, Ser. No. 546,548, now Patent No. 3,518,288, dated June 30, 1970. Divided and this application Aug. 8, 1969, Ser. No. 848,715

Int. Cl. C08g *22/44*

The portion of the term of the patent subsequent to Aug. 20, 1985, has been disclaimed

U.S. Cl. 260—2.5 AM **7 Claims**

An improved process of making rigid polyurethane foams is disclosed which comprises incorporating therein new siloxane-polyethylene oxide copolymers. With this process it is possible to consistently produce uniform fine-celled foams having a high percentage of closed cells under a wide variety of manufacturing conditions.

3,663,469

PARTICLE-CONTAINING ELASTIC POLYURETHANE LAYER

Joseph A. Weissmahr, Rome, Italy, assignor to Wertex Anstalt, Vaduz, Liechtenstein

No Drawing. Filed Oct. 17, 1969, Ser. No. 867,386

Claims priority, application Italy, Nov. 7, 1968, 40,972/68

Int. Cl. C08f *47/08;* **C08g** *22/44, 41/04*

U.S. Cl. 260—2.5 BE **6 Claims**

An elastic layer of polyurethane is prepared by binding granulated elastic material with a liquid polyurethane composition which cures to a resilient solid product. When the spaces between the granulated material is only partially filled with the liquid, a porous article results.

3,663,470

METHOD OF PRODUCING POLYVINYL ACETAL POROUS ARTICLES AND THE SHAPED POROUS ARTICLES MADE THEREFROM

Hiroshi Nishimura, Sowa-machi, and Shizuo Sato, Tokyo, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed May 28, 1970, Ser. No. 41,631

Claims priority, application Japan, June 5, 1969, 44/44,387

Int. Cl. C08f *27/20, 47/08*

U.S. Cl. 260—2.5 F **12 Claims**

Polyvinyl acetal porous articles having useful and excellent properties as cosmetic sponge puff, sponge handkerchief, filtering media and the like are produced by reacting an aqueous solution of polyvinyl alcohol with an aldehyde and an acid catalyst in the presence of at least one water soluble inorganic salt, with or without a pore forming agent.

3,663,471

THERMOPLASTIC MOLDING COMPOSITIONS AND MOLDINGS OF POLYCARBONATES ADMIXED WITH A GRAFT COPOLYMER

Hermann Schirmer, Krefeld, Gunter Peilstocker, Krefeld-Bockum, and Hugo Vernaleken, Krefeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 2, 1970, Ser. No. 343

Claims priority, application Germany, Jan. 8, 1969, P 19 00 756.8

Int. Cl. C08f *15/00;* **C08g** *39/00, 51/04, 57/14*

U.S. Cl. 260—40 **6 Claims**

The invention relates to thermoplastic moulding compositions and mouldings of polycarbonates of dihydric phenols having improved properties containing particular amounts of particular graft polymers admixed to the polycarbonates. The particular graft polymers are manufactured from about 50 to about 90% by weight of polybutadiene and a mixture of about 5 to about 40% by weight of acrylonitrile and about 5 to about 45% by

weight of an aromatic vinyl hydrocarbon, such as styrene, and said graft polymers are present in an amount of about 0.5 to about 9.5 parts by weight for about 99.5 to about 90.5 parts by weight of polycarbonate.

3,663,472

COMPOSITION AND METHOD FOR SURFACING LEATHERS AND LEATHER SUBSTITUTES BASED ON FILLED POLYURETHANE LATEX

Albert E. Raymond, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation of application Ser. No. 755,436, Aug. 26, 1968. This application Mar. 15, 1971, Ser. No. 124,230

Int. Cl. C08g *41/04, 51/14*

U.S. Cl. 260—6 4 Claims

Formation of leather-like surfacing from coating compositions comprising aqueous dispersions of polyurethane latex containing 10 to 50 percent by weight of a tough, flexible, organic particulate filler such as leather dust, organic spheroids, or the like, having an average diameter of 10 to 75 microns, the slurry having a mayonnaise-like consistency and a viscosity of about 30 to 2500 poise and being suitable for coating of substrates such as imperfect leather, leather splits, woven or non-woven fabrics, or polymeric films.

3,663,473

PRECIPITATION METHOD OF PREPARING ALKALINE-EARTH METAL FLUORO-CHLORO PHOSPHATE PHOSPHOR

Joseph W. Sausville, Glen Rock, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Filed Nov. 6, 1970, Ser. No. 87,578

Int. Cl. C09k *1/36*

U.S. Cl. 252—301.6 P 5 Claims

An improved method of preparing alkaline-earth metal fluoro-chloro-phosphate phosphor is detailed, wherein metal activator doped alkaline-earth metal fluoro-apatite is precipitated from solution and thereafter fired to incorporate chlorine into the phosphor matrix and optimize the luminescence of the resulting halophosphate phosphor. An aqueous solution essentially containing as reactive constituents predetermined amounts of alkaline-earth metal, phosphate radical, fluorine and antimony is prepared with a pH value of less than about 4.5. The aqueous solution is maintained at a temperature greater than about 65° C., whereby apatite-structured alkaline-earth metal fluorophosphate is formed. A predetermined amount of selected basic compound is added to the solution to adjust the pH value to from about 6 to 8.5. A soluble chlorine containing compound is included in the solution, either prior to or after the pH is raised, as well as soluble compounds of any additional metal activator constituents, and the solution is digested. The resultant activator doped fluoropatite is then separated from solution, and after drying is fired to incorporate chlorine into the phosphor matrix and optimize the luminescence of the phosphor.

3,663,474

ERBIUM OXIDE/YTTERBIUM OXIDE DOPED GLASS LASERS

Haynes A. Lee, Jr., Sylvania, and Charles F. Rapp, Toledo, Ohio, assignors to Owens-Illinois, Inc.

No Drawing. Continuation-in-part of application Ser. No. 765,039, Oct. 4, 1968. This application Apr. 14, 1970, Ser. No. 28,518

The portion of the term of the patent subsequent to July 22, 1986, has been disclaimed

Int. Cl. C09k *1/54;* C03c *3/28, 3/04*

U.S. Cl. 252—301.4 F 26 Claims

Erbium oxide/ytterbium oxide glass laser compositions useful as laser rods having relatively high efficiency and low solarization are provided, the compositions containing about 45 to 75 mole percent silica, about 15 to 35 percent lithia, 0 to 8 percent alumina and 0 to 30 percent calcia, with the total of lithia and calcia being not substantially more than about 50%.

3,663,475

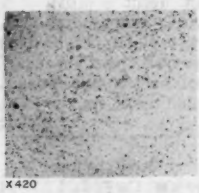
NOVEL DIAMOND POWDER DISPERSIONS AND PROCESS FOR OBTAINING SAME

Francis J. Figiel, Boonton, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 651,354, July 3, 1967. This application Mar. 6, 1970, Ser. No. 17,319

Int. Cl. B01j *13/00*

U.S. Cl. 252—309 20 Claims



X420

This application is directed to dispersions of synthetic shock-formed diamond powder and to the method of obtaining same by subjecting a mixture of synthetic shock-formed diamond powder in a liquid dispersion medium to shear stresses. The preferred dispersions are stable for at least 24 hours. The diamond powder used is characterized by an average particle diameter range of from about 7×10^{-4} to about 1×10^{-2} microns and a surface area of between about 40 and about 400 square meters per gram.

3,663,476

ALKALINE STRIPPING COMPOSITION AND PROCESS

Donald P. Murphy, Roseville, Mich., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Mar. 20, 1969, Ser. No. 809,011

Int. Cl. C11d *7/16, 7/32*

U.S. Cl. 252—529 4 Claims

An aqueous alkaline stripping solution which contains an accelerator composition comprised of an alkylene glycol aryl ether, tripropylene glycol or dipropylene glycol, and an organic nitrogen compound of the formula:

wherein R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen, alkanol and hydroxy ether groups wherein the hydroxy group is terminal, which latter groups contain from about 2 to 10 carbon atoms, at least 1 of R_1, R_2 and R_3 being other than hydrogen, the compound having a boiling point of at least about 100 degrees C. and a molecular weight which is not substantially in excess of about 500. The preferred components of the activator composition are ethylene glycol monophenyl ether, tripropylene glycol and triethanolamine.

3,663,477

DILATANT AQUEOUS POLYMER SOLUTIONS

George P. Ahearn, Houston, Tex., assignor to Esso Production Research Company

Continuation-in-part of application Ser. No. 595,733, Nov. 21, 1966. This application Feb. 27, 1970, Ser. No. 14,905

Int. Cl. B65g *53/04;* E21b *43/16;* B01j *13/00*

U.S. Cl. 252—311.5 10 Claims

A composition of matter including as essential ingredients at least 0.001 weight percent of a high molecular

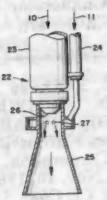
weight polymer of ethylene oxide, between about 0.5 weight percent and about 10 weight percent of a petroleum sulfonate having an average molecular weight of at least 400, and a major proportion of water. The composition exhibits non-Newtonian dilatant rheological characteristics. The composition has utility as a liquid vehicle for the transportation of particulate solids, as a fluid for fracturing subterranean oil-bearing formations, and as a fluid for displacing oil from subterranean formations.

3,663,478

SULFUR-OIL SLURRY PREPARATION FOR PIPELINE TRANSPORTATION

Calvin J. Kuhre, Kensington, and Clifford C. Segerstrom, Lafayette, Calif., assignors to Shell Oil Company, New York, N.Y.

Filed Apr. 7, 1970, Ser. No. 26,278
Int. Cl. B01j *13/00*
U.S. Cl. 252—314 **7 Claims**



An improved method of preparing a sulfur-oil slurry for pipeline transportation using a shrouded nozzle for injection of molten sulfur into oil to form the slurry.

3,663,479

EXTENDED-SURFACE DISPERSIBLE HYDROGENATION CATALYST AND PROCESS FOR PRODUCING SAME

Norman V. Lovegren, Marie S. Gray, and Reuben O. Feuge, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed June 24, 1970, Ser. No. 49,555
Int. Cl. C11c *3/12*
U.S. Cl. 252—429 **10 Claims**

Nylon is dissolved in an aqueous solution of formic acid, or dissolved in a primary solvent such as ortho-phosphoric acid, meta-cresol, or phenol, in conjunction with ethyl alcohol as a secondary solvent, then precipitated in microscopic-sized particles by the addition of water. The precipitated nylon particles are washed with water until free of solvent. The nylon particles are mixed with an aqueous solution of a platinum (or palladium) compound, stirred and heated, thereby producing an easily dispersed hydrogenation catalyst of high surface area that is useful for selectively hydrogenating unsaturated fatty esters.

3,663,480

CATALYTIC COMPOSITION FOR THE PREPARATION OF HIGH VINYL POLYBUTADIENE

Robert P. Zelinski and Richard J. Sonnenfeld, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Mar. 9, 1970, Ser. No. 17,936
Int, Cl. C08d *1/14*
U.S. Cl. 252—431 **9 Claims**

A catalyst system is disclosed which is used to prepare high vinyl polybutadiene by the polymerization of 1,3-butadiene to obtain a product having at least 75 percent 1,2-addition. The catalyst system consists of a molybdenum compound and an aluminum compound wherein the molybdenum compound is represented by the general formula MoX_aY_b and the aluminum compound is represented by the general formula R_cAlY_d. In the above formulas X is a halogen, Y is selected from the formulas OR and O_2CR wherein R is a hydrocarbyl radical containing 1 to 30 carbon atoms, and the sum of *a* and *b* is 5, the sum of *c* and *d* is 3, *a* and *b* are integers having a value of 1 to 4, and *c* and *d* are integers having a value of 1 to 2.

3,663,481

PHENOL-FORMALDEHYDE ADHESIVE RESIN CONTAINING HYDROXYETHYL CELLULOSE

Harlan G. Freeman, Gene F. Baxter, and John T. Howell, Seattle, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,261
Int. Cl. C08b *21/32;* **C08g** *37/18*
U.S. Cl. 260—14 **10 Claims**

Improved phenol-formaldehyde adhesive resins suitable for plywood manufacture are obtained by premixing with aqueous formaldehyde about 0.3–6.0 weight percent of hydroxyethyl cellulose based on formaldehyde and thereafter reacting the hydroxyethyl cellulose formaldehyde solution with phenol in the presence of alkali to obtain a thermosetting phenol-formaldehyde resole resin. When formulated as a plywood glue, this modified phenol-formaldehyde resin provides an adhesive glue with enhanced tolerance to a wide variety of wood and production variables including assembly time.

3,663,482

AQUEOUS SUSPENSION POLYMERISATION PROCESS FOR VINYL HALIDES

Geoffrey James Gammon, Ashford, England, assignor to The British Petroleum Company Limited, London, England

No Drawing. Filed Mar. 13, 1970, Ser. No. 19,477
Claims priority, application Great Britain, Mar. 21, 1969, 14,929/69
Int. Cl. C08f *1/11*
U.S. Cl. 260—17 R **15 Claims**

This invention relates to a process for the production of vinyl or vinylidene halide polymers by aqueous suspension polymerisation of the monomers in the presence of a free radical initiator and using a sparingly soluble inorganic phosphate suspending agent in conjunction with a metal alkyl phosphate extender. The phosphate suspending agents are suitably the hydroxy-apatities and the extender is suitably an alkali metal alkyl phosphate, the alkyl group having from 2 to 20 carbon atoms.

3,663,483

STEAM JET COOKING METHOD FOR MAKING AQUEOUS RESIN EMULSIONS AND COMPOSITIONS CONTAINING SUCH EMULSIONS FOR COATING PAPER

Clyde W. Steele, Wisconsin Rapids, Wis., assignor to Nekoosa-Edwards Paper Company, Inc., Port Edwards, Wis.

Filed Dec. 15, 1969, Ser. No. 885,058
Int. Cl. C08g *37/18*
U.S. Cl. 260—17.2 **21 Claims**

Preparation of an aqueous emulsion of meltable, oil-soluble but water insoluble, acidic polymeric material of phenol-aldehyde or alkyl phenol-acetylene resins, and a protective colloid-forming binder of starches or gums for use as a paper coating composition of between 15 and 70% total solids content. Such an emulsion is prepared by flowing an aqueous stream of resin and starch through a confined heating zone of an eductor system into contact and admixture with a steam jet in such weight proportions and under such pressure and temperature

conditions as to convert the resin without further mechanical grinding thereof into spherical particles of about 10 microns or less maximum dimension dispersed in

cooked starch as a protective colloid therefor. The final resin-containing emulsion can optionally include pigments, dispersants and anionic surfactants.

3,663,484

METHOD FOR MANUFACTURING WATER-DILUTABLE, VINYL MODIFIED SYNTHETIC RESINS BASED ON POLYETHER ESTERS

Bernhard Broecker, Hamburg, Germany, assignor to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg, Germany

No Drawing. Filed June 11, 1970, Ser. No. 45,601
Claims priority, application Switzerland, June 11, 1969, 8,326/69; Jan. 30, 1970, 1,325/70; Mar. 31, 1970, 4,712/70
Int. Cl. C09d *3/58*; C23b *13/00*
U.S. Cl. 260—19 EP **31 Claims**

Water-dilutable, vinyl modified synthetic resins based on polyetheresters which are reaction products of

(a) compounds carrying epoxy groups and possibly also hydroxyl groups,

etherified with

(b) monovalent alcohols with 3–20 C atoms, having at least one and preferably several ethylenic double bonds, by heating,

then esterified with

(c) the etherification products with aliphatic monocarboxylic acids with 6–20 C atoms, containing preferably one or more ethylenic double bonds,

thereafter

(d) reacted with such amounts of α,β-ethylenically unsaturated mono or polycarboxylic acids possibly in the presence of other vinyl or vinylidene compounds, by heating, so that the reaction products have an acid number of at least 25,

and

(e) mixed with such amounts of ammonia and/or strong organic nitrogen bases up to complete or partial neutralization, until the reaction products are sufficiently dispersible of water-dilutable.

Preferred are the polyetheresters of this invention, usable for the manufacture of electrophoretically depositable synthetic binders, which are obtained when the new polyetheresters are mixed together with phenoplasts and/or aminoplasts before the neutralization with ammonia or amines and are subjected to a precondensation by heating to temperatures of 100° to 150° C., the heating of the mixture being interrupted immediately if the formed precondensate has reached the necessary acid number.

3,663,485

PROCESS FOR THE PRODUCTION OF BINDERS FOR AQUEOUS COATINGS

Bernhard Broecker, Hamburg, Germany, assignor to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg, Germany

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,094
Claims priority, application Switzerland, Nov. 17, 1969, 17,041/69
Int. Cl. C08g *37/18*; C09d *3/52*
U.S. Cl. 260—19 EP **5 Claims**

The invention consists of a method of making a binder for aqueous coatings based on plasticized, neutralized resins I and heat-curing, water-soluble on at least hydrophilic, low-molecular aldehyde condensation products II. The plasticized resins I are new polyetherester resins with valuable properties. The heat-curing, water-soluble or at least hydrophilic, low-molecular aldehyde condensation product II are known in the art.

3,663,486

PHENOLIC RESIN COMPOSITIONS AND A METHOD FOR THE PREPARATION THEREOF

William A. Keutgen, Martinsville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Nov. 10, 1969, Ser. No. 875,535
Int. Cl. C08g *5/20*
U.S. Cl. 260—19 **6 Claims**

This invention relates to phenolic resin compositions, suitable for use in molding applications and to a method for the preparation thereof by adding a Group II metal hydroxide or oxide to a liquid phenolic novolac resin to form a solution and thereafter adding to this solution, with agitation, a monobasic acid and if desired a filler such as sand with the result that the sand is coated by the phenolic resin and a Group II metal salt is precipitated and dispersed throughout the resultant free-flowing composition.

3,663,487

METHOD OF MAKING VINYL-MODIFIED SYNTHETIC RESINS, BASED ON POLYETHER ESTERS, WHICH ARE CAPABLE OF BEING THINNED WITH WATER

Bernhard Broecker, Hamburg, Germany, assignor to Reichhold-Albert-Chemie Aktiengesellschaft

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,079
Claims priority, application Switzerland, Nov. 17, 1969, 17,041/69
Int. Cl. C08f *19/14*; C09d *3/58, 5/02*
U.S. Cl. 260—23 EP **4 Claims**

The invention consists in a method of making vinyl-modified synthetic resins, based on polyether-esters, which are capable of being thinned with water, and which have valuable properties.

3,663,488

POLYOLEFINE FILMS

John Alan Elliott Kail, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Mar. 24, 1969, Ser. No. 809,977
Claims priority, application Great Britain, Apr. 3, 1968, 16,018/68; Dec. 20, 1968, 60,717/68
Int. Cl. C08f *19/14*
U.S. Cl. 260—23 H **7 Claims**

Polyolefine film of high gloss and clarity which is suitable for twist wrapping and contains from 5% to 30% of a polyterpene, hydrogenated polyterpene or a rosin derivative.

3,663,489
HEAT-RESISTANT PHENOLIC RESIN FOAM FORMING COMPOSITION
Thomas J. Byerley, Shawnee Mission, Kans., and Howard W. Christie, Kansas City, Mo., assignors to Butler Manufacturing Company, Kansas City, Mo.
No Drawing. Filed Feb. 19, 1970, Ser. No. 12,845
Int. Cl. C08j *1/18*
U.S. Cl. 260—2.5 F 3 Claims

A heat-resistant phenolic resin composition comprising a phenolaldehyde resole and a boron containing compound formed by reacting boric acid or boric oxide with glyoxal, glyoxal trimer, substituted glyoxal and glyoxal derivatives. These reaction products produce an "acid like" cure of the resin as they are weak acids in the presence of the water in the phenoleformaldehyde resole.

The resin may be made into coatings, castings or, by the addition of a surfactant and a blowing agent, foams may be produced.

3,663,490
ACRYLIC ACID-ACRYLAMIDE-DIACETONE ACRYLAMIDE TERPOLYMER
Amir M. Sarem, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Original application Dec. 21, 1967, Ser. No. 692,383, now Patent No. 3,476,186. Divided and this application July 28, 1969, Ser. No. 845,492
Int. Cl. C08f *15/40*
U.S. Cl. 260—29.6 TA 17 Claims

A novel water-soluble terpolymer of acrylic acid, acrylamide and diacetone acrylamide useful as a flood water additive and a method for preparing the polymer in which the monomers are copolymerized in the presence of an organoboron catalyst.

3,663,491
ADHESIVE OF A POLYMER LATEX, A RESOL RESIN AND A NOVOLAK RESIN
Richard W. Kibler, Cuyahoga Falls, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
No Drawing. Original application Oct. 27, 1967, Ser. No. 678,517, now Patent No. 3,547,729, dated Dec. 15, 1970. Divided and this application Mar. 2, 1970, Ser. No. 18,776
Int. Cl. C08g *51/24*
U.S. Cl. 260—29.3 8 Claims

Natural and synthetic rubbers and mixtures thereof are adhered to fabrics such as polyester tire cords, by an adhesive of a resol condensation product, a novolak resin and a latex of a polymer of a conjugated diene monomer and an unsubstituted or alkyl-substituted monovinylpyridine such as disclosed in Mighton U.S. Reissue Patent 23,451, which polymer preferably also includes styrene. The invention includes the adhesive, fabrics coated with the adhesive and with a rubber vulcanized thereto, the method of producing the adhesive and the method of treating the fabric and adhering rubber to it.

3,663,492
PROCESS FOR THE PREPARATION OF POLYAMIDOCARBOXYLIC ACIDS
Erich Behr, Troisdorf, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
No Drawing. Filed Jan. 6, 1971, Ser. No. 104,522
Claims priority, application Germany, Jan. 31, 1970, P 20 04 495.5
Int. Cl. C08g *51/02, 51/44, 51/48*
U.S. Cl. 260—30.2 R 10 Claims

New and improved process of producing polycarboxy pendant polycarbonamide polymers suitable for cyclization into polyimides by forming a dispersion of each reactant, that is, a tetracarboxylic acid (or a corresponding mono or dianhydride) and a diamine respectively, in an inert substantially non-polar, organic substantially anhydrous liquid; and then adding a polar organic solvent slowly to the dispersion either continuously or intermittently, with stirring and appropriate heat control, whereby said reactants react to form said polycarboxyl pendant polycarbonamide.

3,663,493
PROCESS FOR THE PRODUCTION OF MARBLEIZED REINFORCED POLYACRYLIC COMPOSITIONS
Robert E. Miller, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Dec. 29, 1969, Ser. No. 888,829
Int. Cl. B29c *21/00;* C08f *29/50, 45/02*
U.S. Cl. 260—31.8 M 9 Claims

Method for preparing marbleized inorganic filler reinforced polyacrylic composite products by the free radical catalyzed polymerization of an acrylic monomer in the presence of at least 25 and up to 90 weight percent of an inorganic particulate filler and a coupling agent to effect chemical bonding between the filler and the polymer; characterized by the addition to a moving monomer-coupling agent-filler slurry composition, which slurry composition may be partially polymerized prior to said addition, of ribbons of pigmented solid polymeric compositions consisting of a polyblend of a polyvinyl chloride-polyvinyl acetate copolymer with a polyalkyl methacrylate and plasticizer therefor together with one or more pigment additives in an amount to give the desired color and optionally containing one or more inorganic fillers and coupling agents of the same general nature as that present in the slurry composition, wherein said addition of the pigmented polymeric ribbons is effected just prior to casting and for a sufficient exposure time in the slurry to cause said ribbons to partially dissolve in said slurry and form color-shaded striations therein simulating the natural texture and coloration of variegated and banded marbles and other similar quarried rock.

3,663,494
STABILISED TITANIUM DIOXIDE FOR POLYCARBONATE MOULDING COMPOSITIONS
Gerhard Kienast and Gunter Peilstocker, Krefeld, Hans G. Volz, Krefeld-Bockum, and Wolfgang Wiegreffe, Krefeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Oct. 29, 1970, Ser. No. 85,286
Claims priority, application Germany, Nov. 22, 1969, P 19 58 665.3
Int. Cl. C08g *51/04*
U.S. Cl. 260—37 PC 3 Claims

Rutile pigments for colouring polycarbonate moulding compositions which have an improved light stability by incorporating into the TiO_2 0.2 to 5% by weight of zinc oxide and by coating the calcined pigment with aluminium phosphate.

3,663,495
SELF-EXTINGUISHING POLYAMIDE MOULDING COMPOSITIONS
Dietrich Michael, Krefeld-Bockum, and Wilfried Kosiol, Moers, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Oct. 17, 1969, Ser. No. 867,380
Claims priority, application Germany, Oct. 17, 1968, P 18 03 606.1
Int. Cl. C08g *51/10, 51/58*
U.S. Cl. 260—37 N 4 Claims

Self-extinguishing polyamide moulding compositions containing as flame retardant agents, melamine, a derivative of melamine, or the melamine condensation product melam in synergistic combination with organic halogen compounds.

3,663,496

ABLATIVE COMPOSITION COMPRISING RUBBER, RESIN, AND FILLER

William P. Whelan, Wayne, N.J., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Sept. 14, 1964, Ser. No. 397,670
Int. Cl. C08g *51/08*
U.S. Cl. 260—38 5 Claims

An ablative composition, resistant to erosion by high velocity hot gases, comprising a cured blend of rubber (e.g., 35–75% butadiene-acrylonitrile rubber), resin (e.g., correspondingly 65–25% phenol-formaldehyde resin) and particulate filler (e.g., graphite in amount of 15 to 80% of the whole mixture). Useful for making molded rocket nozzle liners.

3,663,497

FRICTION MATERIAL

Kiyosha Ninomiya and Hideaki Ohara, Nagoya-shi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya-shi, Aichi-ken, Japan

Continuation-in-part of application Ser. No. 723,350, Apr. 19, 1968. This application Sept. 16, 1970, Ser. No. 72,698
Claims priority, application Japan, Apr. 28, 1967, 42/27,651
Int. Cl. C08g *51/12*
U.S. Cl. 260—38 4 Claims

An improved friction material for friction-engaging mechanisms, such as automotive brakes and clutches, comprising about 30 to 80% of iron oxide powder whose main ingredient is ferrosoferric oxide, such as iron sand, about 15 to 65% of organic binder, and the balance of fillers and additives, whereby to improve wear, reduce defacement and provide a substantially constant coefficient of friction.

3,663,498

THERMOPLASTIC MOULDING COMPOSITIONS ON THE BASIS OF SATURATED POLYESTERS

Rudolf Uebe, Hofheim, Taunus, and Ludwig Brinkmann, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 28, 1970, Ser. No. 68,048
Claims priority, application Germany, Sept. 5, 1969, P 19 45 102.6
Int. Cl. C08g *17/00*
U.S. Cl. 260—40 R 12 Claims

Moulding compositions are prepared on the basis of linear saturated polyesters, inert inorganic solid substances, and alkali metal aralkyl sulfonates, which are suitable for processing in the thermoplastic range, and from which shaped articles having good mechanical properties can be manufactured exhibiting a very good surface quality and not showing any discoloration, which come off the mould already after a short dwell time in the mould, a fact that makes them particularly suitable for the manufacture of complex shaped articles.

3,663,499

INJECTION MOLDED ARTICLES OF THERMOPLASTIC POLYESTER RESINS CONTAINING TITANIUM DIOXIDE

Ludwig Brinkmann, Frankfurt am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Continuation of application Ser. No. 782,483, Dec. 9, 1968. This application Jan. 7, 1971, Ser. No. 104,793
Claims priority, application Germany, Dec. 9, 1967, P 16 94 232.8
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 R 12 Claims

Thermoplastic moulding compositions of linear, saturated polyesters and titanium dioxide which can be processed in the thermoplastic range to obtain shaped articles of high impact strength and dimensional stability.

3,663,500

UNSATURATED POLYESTER RESINS ADMIXED WITH POLYURETHANES OR CYCLOALIPHATIC DIEPOXIDES

John Dinsdale Crabtree, Rainhill, near Liverpool, Kenneth Henry Grundy, Ashton-on-Mersey, Sale, and Alan Edward Johnson, Sutton Leach, St. Helens, England, assignors to Fibreglass Limited, Liverpool, England

No Drawing. Filed June 2, 1969, Ser. No. 829,734
Claims priority, application Great Britain, June 4, 1968, 26,470/68
Int. Cl. C08g *51/10, 17/10*
U.S. Cl. 260—40 R 7 Claims

A polyester resin for reinforcement by glass fibres is modified by the addition of a urethane, a cycloaliphatic epoxide, or a derivative of a cycloalphatic epoxide with methacrylic acid.

3,663,501

ADHESIVE CEMENT

Robert J. Adams and Wendell C. Overhults, East Brunswick, N.J., assignors to Johnson & Johnson

No Drawing. Filed June 11, 1970, Ser. No. 45,538
Int. Cl. C08f *45/04*; A61k *5/02*
U.S. Cl. 260—41 R 9 Claims

Adhesive compositions comprising a polymerizable monomeric ester of α-cyanoacrylic acid are substantially improved by the addition of about 5 to 25 parts by weight of sodium fluoride. The compositions preferably contain a finely-divided filler, and still further improvement results from the selection of a particular particle size for the filler, e.g., a mixture containing a substantial proportion of about 40–50 and about 90–100 micron size particles. The preferred filler is alumina having about equal proportions of the smaller and larger particle sizes.

These improved adhesive compositions are activated by an amine catalyst, preferred forms being the tertiary amines N,N-dimethyl-p-toluidine and N,N-dimethylaniline. They can be applied to either dry or wet surfaces of a variety of materials. Upon curing, they exhibit enhanced bonding and resistance to wear and long-term deterioration, even under submerged or otherwise moist conditions. They are particularly suitable for the treatment of teeth, e.g., for filling pits, cracks and fissures to prevent caries and for temporary fillings and the preparation of dental restorations.

3,663,502

TERTIARY PHOSPHINE OXIDE-AMMONIUM POLYPHOSPHATE COMBINATIONS AS FLAME-RETARDANTS FOR PROPYLENE POLYMERS

Robert William Murray, Lebanon, and Christos Savides, Piscataway, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Oct. 29, 1970, Ser. No. 85,307
Int. Cl. C08f *45/04, 45/60*; C09k *3/28*
U.S. Cl. 260—41 11 Claims

Flame-retardant compositions comprising (A) a phosphine oxide having the formula

$$R_3P{=}O \text{ or } (R_2\overset{\overset{O}{\|}}{P}CH_2)_2$$

wherein R is 2-cyanoethyl, 2-carbamoylethyl or 2-(N-alkylcarbamoyl)ethyl and (B) ammonium polyphosphate and propylene polymers containing said compositions, are disclosed.

3,663,503
COLORLESS, COLD CURE PHENOLIC RESIN CONTAINING SULFUR STABILIZERS

Rudolf H. E. Klemke, Sparta, N.J., assignor to Mohawk Industries Inc., Sparta, N.J.

No Drawing. Filed Feb. 25, 1970, Ser. No. 14,178
Int. Cl. C08g *51/60*
U.S. Cl. 260—45.8 N 3 Claims

The specification discloses a phenolic resin composition comprising an organic compound having an S=C moiety which composition can be cold cured to a colorless or white product and a method for providing a colorless or white cold cured phenolic resin composition by incorporating in the resin an organic compound characterized by the presence of a C=S group and then curing the resin with a strong organic acid.

3,663,504
RADIATION-RESISTANT PLASTIC INSULATORS

Bernard J. Sturm, Oak Ridge, and William W. Parkinson, Kingston, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Nov. 10, 1970, Ser. No. 88,484
Int. Cl. C08f *45/58, 51/58*
U.S. Cl. 260—45.7 P 7 Claims

A high molecular weight organic composition useful as an electric insulator in radiation fields is provided and comprises normally a solid polymer of an organic compound having a specific resistance greater than 10^{19} ohm-cm. and containing phenyl groups and 1 to 7.5 weight percent of a high molecular weight organic phosphite. In one embodiment the composition comprises normally solid polystyrene having 7.5 weight percent tris-β-chloroethyl phosphite as an additive; the composition exhibited an increase in the post-irradiation resistivity of over an order of magnitude over the post-irradiation resistivity of pure polystyrene.

3,663,505
ANTIOZONANT COMPOSITION AND USE THEREOF IN NATURAL AND SYNTHETIC RUBBER COMPOSITIONS

Alfred E. Hoffman, Saddle River, N.J., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 666,493, Sept. 8, 1967. This application Apr. 2, 1970, Ser. No. 25,256
Int. Cl. C08d *11/04*
U.S. Cl. 260—45.9 R 10 Claims

Novel antiozonant composition comprising a mixture of N,N'-di-alkyl-p-phenylenediamine in which each alkyl contains 6 to 10 carbon atoms, N-phenyl-N'-alkyl-p-phenylenediamine in which the alkyl contains 3 to 6 carbon atoms, and N-phenyl-N'-alkyl-p-phenylenediamine in which the alkyl contains 7 to 10 carbon atoms, and use of said composition in rubber.

3,663,506
STABILIZATION OF URETHANE POLYMERS WITH SUBSTITUTED UREAS

Robert John Knopf, St. Albans, Lloyd Marshall Bowne, Nitro, and Robert Darrell Hiser, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Nov. 18, 1970, Ser. No. 90,871
Int. Cl. C08g *17/58*
U.S. Cl. 260—45.85 9 Claims

Urethane polymers are stabilized against discoloration by certain substituted ureas, some of which are novel. The invention is particularly useful for stabilizing spandex fibers, urethane films, foams, and the like, against discoloration.

3,663,507
LINEAR POLYARYLSULFONES HAVING FUNCTIONAL GROUPS THEREON

Herward A. Vogel, Oakdale Township, Washington County, and Hans T. Oien, Lakeland, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation of application Ser. No. 625,011, Mar. 22, 1967. This application Jan. 2, 1970, Ser. No. 488
Int. Cl. C08g *17/00, 20/32*
U.S. Cl. 260—49 14 Claims

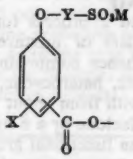
Certain linear thermoplastic polyarylsulfones having reactive groups thereon are disclosed. The reactive groups can recur along the polymer chains and/or can occur at the ends of the chains. In addition, segmented (graft and block) copolymers containing polyarylsulfone segments are disclosed. The linear and segmented polymers have wide areas of utility, e.g. in coatings, impregnants, films, filaments, and molded articles, etc.

3,663,508
MODIFIED POLYESTERS AND SHAPED STRUCTURES MADE THEREFROM

Heinzhorst Möbius, Frankfurt am Main, Günter Keil, Lorsbach, Taunus, and Franz Jakob, Hofheim, Taunus, Germany, assignors to Hoechst Fibers Incorporated, Spartanburg, S.C.

No Drawing. Filed Sept. 3, 1968, Ser. No. 757,163
Claims priority, application Germany, Feb. 10, 1968, P 16 94 244.2
Int. Cl. C08g *17/14*
U.S. Cl. 260—49 12 Claims

The present invention relates to novel modified polyesters containing in the polymer molecule 0.1 to 10 mol percent of sulfonate groups-containing chain members of the general formula



having an improved affinity for cationic dyestuffs and to filaments, fibers and films made of the said polyesters.

3,663,509
SULPHONATED POLYETHERS

Lucien Bonnard and Rene Pich, Lyon, and Alain Palsky, Caluire, Rhone, France, assignors to Societe Rhodiaceta, Paris, France

No Drawing. Filed Oct. 28, 1968, Ser. No. 771,358
Claims priority, application France, Oct. 31, 1967, 126,583; Mar. 12, 1968, 143,387
Int. Cl. C08g *5/00, 5/02;* C07c *143/50*
U.S. Cl. 260—49 7 Claims

The present invention relates to new sulphonated polyethers used as agents for modifying polyamides and polygeously be incorporated in polyesters or polyamides as a dispersion or, in the case of polyesters, as part of the polymer molecule, to improve their affinity for basic dyestuffs.

3,663,510
PROCESS FOR PRODUCING POLYAMIDE COATING MATERIALS

Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company

Filed May 8, 1969, Ser. No. 823,108
Int. Cl. C08g *20/32*
U.S. Cl. 260—65 25 Claims

In the present invention, I prepare polyamide prepolymers from aromatic dianhydride and aromatic diamine

materials by first producing a stable nonionic precursor material in the form of the reaction product of an aromatic dianhydride and aromatic diamine in the molar ratio of 2/1. There is then added to this stable precursor which may be represented by the formula XYX, wherein X represents aromatic dianhydride and Y represents aromatic diamine, a slight molar excess of Y and in so doing, I do not follow the expected path of polymerization which had been predicted. Instead, the XYX tends to polymerize only up to a certain point and then I complete the polymerization to any desirable molecular weight range by slowly adding a predetermined additional amount of dianhydride X as a back addition. In this manner, the path of reaction followed by inherent viscosity which is an indicator of molecular weight, then climbs sharply and by means of slowly adding the anhydride I can closely control the molecular weight, substantially increasing such molecular weight and narrowing the range of molecular weight of the polyorthoamic acid prepolyimide material. I can thereby through this procedure obtain any preselected desirable molecular weight range by the back addition of dianhydride to amine terminated polyamide prepolymers.

3,663,511

POLYURETHANES CHAIN-EXTENDED WITH A HYDROXYL CONTAINING AMIDE CHAIN EXTENDER

Frank G. Lombardi, Clifton, and Fritz Hostettler, Verona, N.J., assignors to Inter-Polymer Corporation, Passaic, N.J.

No Drawing. Continuation of application Ser. No. 734,901, June 6, 1968. This application June 10, 1970, Ser. No. 48,832

Int. Cl. C08g *22/08*

U.S. Cl. 260—75 NQ **3 Claims**

There is disclosed a process for the manufacture of novel chain extenders or mixtures thereof for use in preparing polyurethanes comprising reaction of an aliphatic, cycloaliphatic, heterocyclic, or aromatic diamine or amino alcohol, with from about 1.0 to about 1.5 moles of an epsilon-caprolactone or a 6-hydroxycaproic acid per mole of active amine functional group of said diamine or amino alcohol, at a temperature of from 100 to 300° C., in the presence or absence of a metallic catalyst.

There is further disclosed a process for the manufacture of polyurethane polymers which comprises reacting a member of the group consisting of (a) polyesters prepared from dicarboxylic acids and glycols, (b) polyesters prepared from epsilon-caprolactones or 6-hydroxycaproic acids, or (c) polyethers prepared from 1,2-alkylene oxides and/or tetrahydrofuran, with organic polyisocyanates and a chain extender prepared as described above.

3,663,512

PROCESS FOR THE PREPARATION OF HIGH MOLECULAR WEIGHT POLYESTERS FOR INJECTION MOULDING PURPOSES

Rudolf Uebe, Hofheim, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 1, 1970, Ser. No. 51,741

Claims priority, application Germany, July 9, 1969, P 19 34 719.4

Int. Cl. C08f *17/013*

U.S. Cl. 260—75 R **11 Claims**

A process for the preparation of linear saturated polyesters of aromatic dicarboxylic acids and saturated aliphatic or cycloaliphatic diols, using carboxylic acid manganese salts as transesterification catalysts, which contain from 3 to 20 carbon atoms in the anion and an epoxy group. The said polyesters are suitable for injection-moulding purposes.

3,663,513

POLYURETHANE ADHESIVE COMPOSITION

Seizi Kazama and Masamitsu Nakabayashi, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Oct. 5, 1970, Ser. No. 78,162

Claims priority, application Japan, Oct. 6, 1969, 44/79,760

Int. Cl. C08g *22/22, 41/00*

U.S. Cl. 260—75 NT **3 Claims**

Adhesive composition which is particularly useful in bonding polyesters or polyolefines to themselves or to other substrates comprises per 100 weight parts of component (A) about 1 to about 30 weight parts of component (B), component (A) being a hydroxy terminated polyurethane prepolymer which is prepared by reacting a polyester diol having a molecular weight of about 500 to about 3000 with ω,ω'-diisocyanato dimethyl benzene in such a ratio that NCO/OH is about 1/1 to give an NCO-terminated prepolymer and reacting the prepolymer with a low molecular polyol having at least 3 OH groups per molecule in a ratio such that OH/NCO is about 3 to about 10, and component (B) being an NCO-terminated prepolymer which is prepared by reacting a low molecular polyol having at least 2 OH groups per molecule and having a molecular weight of lower than about 400 with an excess amount of ω,ω'-diisocyanato dimethyl benzene.

3,663,514

LIGHT-STABLE POLYURETHANE COATINGS

Robert W. Campbell and Ralph P. Williams, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Apr. 9, 1970, Ser. No. 27,108

Int. Cl. C08g *22/18*

U.S. Cl. 260—77.5 AT **10 Claims**

A polyol is reacted with a diisocyanate to produce a first compound having available for further reaction unreacted isocyanate groups. The first compound is cured to produce a polyurethane compound having improved light stability. The diisocyanate useful in this invention is represented by the formula:

$$OCN—R_1—R_2—R_3—NCO$$

wherein the —NCO group attached to R_1 is more reactive than the —NCO group attached to R_3 and R_1 is an aromatic group, R_2 is an aliphatic group or a direct bond, and R_3 is a 1,4-cyclohexylene group.

3,663,515

PROCESS OF PREPARATION OF POLYCAPROLACTONE POLYESTERS AND POLYURETHANE ELASTOMERS THEREFROM

Fritz Hostettler, Verona, and Frank G. Lombardi, Clifton, N.J., assignors to Inter-Polymer Corporation, Passaic, N.J.

No Drawing. Continuation of application Ser. No. 715,165, Mar. 22, 1968. This application Apr. 13, 1970, Ser. No. 28,173

Int. Cl. C08g *22/10, 17/02*

U.S. Cl. 260—77.5 AN **11 Claims**

There is disclosed a process for the polymerization of linear, predominantly hydroxyl-terminated monomeric components or low molecular weight polymers comprising the reaction products of (a) low-boiling alkylene glycols with 6-hydroxy-caproic acids or alkyl ester derivatives thereof, or optionally (b) low-boiling alkylene glycols with ϵ-caprolactones to higher molecular weight polyesters comprising subjecting said reaction products to temperatures of from about 150° C. to about 300° C. in the presence of an ester interchange catalyst while continuously removing the low-boiling alkylene glycols from the reacting mixture.

There is further disclosed a process for the depolymerization of predominantly hydroxy-terminated polyesters

comprising polymeric reaction products of (a) glycols, amino alcohols or polyamines with 6-hydroxycaproic acids, or alkyl ester derivatives thereof, or optionally comprising (b) polymeric reaction products of glycols, amino alcohols or polyamines with ϵ-caprolactones, to lower molecular weight hydroxyl-terminated polyesters, comprising subjecting said polymeric reaction products to reaction with glycols at temperatures of from 150 to 300° C. in the presence of an ester interchange catalyst. The resulting polyesters are suitable for the production of polyurethane elastomers.

3,663,516

POLYURETHANE PRODUCT AND METHOD OF PRODUCING SAME

Herwart C. Vogt, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Original application July 3, 1967, Ser. No. 650,590, now Patent No. 3,522,304, dated July 28, 1970. Divided and this application Apr. 30, 1970, Ser. No. 43,634

Int. Cl. C08g *22/16*

U.S. Cl. 260—77.5 AQ **1 Claim**

A polyurethane product and method of producing same by coreacting a mixture of an organic polyisocyanate and polyhydroxy diurea. The polyhydroxy diurea in turn comprises the reaction product of a primary or secondary alkanolamine with a compound selected from the group consisting of diisocyanates and dicarbonyl chlorides, the latter being the reaction product of a primary or secondary diamine with phosgene.

3,663,517

PREPARATION OF AROMATIC POLYAMIDES BY INTERFACIAL POLYCONDENSATION

Teruho Adachi, Takarazuka-shi, Japan, assignor to Sumitomo Chemical Co., Ltd., Osaka, Japan

No Drawing. Filed Oct. 1, 1970, Ser. No. 77,336

Claims priority, application Japan, Oct. 1, 1969, 44/78,862

Int. Cl. C08g *20/22*

U.S. Cl. 260—78 R **7 Claims**

A process for producing aromatic polyamides having a high molecular weight, which comprises reacting an aromatic diamine with a dicarboxylic acid halide in the presence of an acetophenone compound by means of interfacial polycondensation.

3,663,518

PROCESS FOR PREPARING ACRYLAMIDE POLYMERS

Harold I. Patzelt and Lawrence J. Connelly, Oak Lawn, Edward G. Ballweber, Chicago, David B. Korzenski, La Grange Park, and Kenneth L. Slepicka, Aurora, Ill., assignors to Nalco Chemical Company, Chicago, Ill.

No Drawing. Continuation of application Ser. No. 780,288, Nov. 29, 1968. This application July 8, 1970, Ser. No. 56,161

Int. Cl. C08f *1/08, 3/90, 15/00*

U.S. Cl. 260—80.3 N **11 Claims**

Monomers soluble in polar solvents, e.g., water and/or methanol, capable of undergoing polymerization exothermically are polymerized by: (1) forming a solution of at least one monomer and a catalyst, (2) forming the thus prepared solution into the form of a thin film, (3) heating the formed thin film to a temperature sufficient to initiate polymerization and initiating such polymerization, and (4) maintaining the polymerization temperature until the polymerization is essentially completed.

3,663,519

COPOLYMERS OF VINYL CHLORIDE

Robert Buening, Troisdorf-Sieglar, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

No Drawing. Filed Mar. 31, 1970, Ser. No. 24,399

Claims priority, application Germany, Apr. 2, 1969, P 19 17 011.7

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.81 **5 Claims**

Copolymers of vinyl chloride, vinyl esters of saturated, alpha-alkyl-substituted monocarboxylic acids having 9 to 19 carbon atoms and ethylene and/or propylene.

3,663,520

PROCESS FOR SUSPENSION POLYMERIZATION OF VINYL CHLORIDE

Thomas Balwe, Johann Bauer, and Kurt Fendel, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,290

Claims priority, application Germany, Apr. 2, 1968, P 17 70 113.2

Int. Cl. C08f *1/11, 3/30, 1/88*

U.S. Cl. 260—87.5 R **1 Claim**

An improvement in the suspension polymerization of a polymerizate containing at least 50% polyvinyl chloride by the steps of mixing (1) monomers selected from the group consisting of vinyl chloride and mixtures of vinyl chloride with up to 50% of olefinically unsaturated compounds copolymerizable with vinyl chloride, (2) a polymerization catalyst, (3) suspension stabilizers including protective colloids, and (4) water, heating said mixture under continuous agitation to polymerization temperatures and recovering said polymerizate. The improvement comprises mixing the monomers with water prior to the addition of the suspension stabilizers including protective colloids. The so-prepared polymerizates require less suspension stabilizers including protective colloids to attain the same size distribution as in the case where the monomer is mixed with water in the presence of the suspension stabilizers including protective colloids.

3,663,521

POLYMERS OF PERFLUOROBUTADIENE AND METHOD OF MANUFACTURE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention by Madeline S. Toy, Orange, and James M. Newman, Huntington Beach, Calif.

No Drawing. Continuation-in-part of application Ser. No. 848,325, Aug. 7, 1969. This application May 19, 1971, Ser. No. 145,026

Int. Cl. C08f *3/20, 15/06*

U.S. Cl. 260—92.1 **7 Claims**

A polyperfluorobutadiene which is a copolymer of perfluoro-1,2- and 1,4-butadiene. One method of initiating the polymerization of the perfluorobutadiene utilizes diisopropyl peroxydicarbonate.

3,663,522

METHOD FOR MULTIPLE DIRECTION PINCH-OFF

Alvin E. Butcher, Bartlesville, Okla., assignor to Phillips Petroleum Company

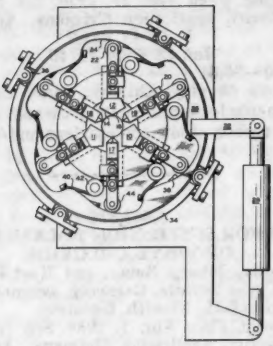
Original application Nov. 14, 1967, Ser. No. 682,745, now Patent No. 3,524,218, dated Aug. 11, 1970. Divided and this application Feb. 5, 1970, Ser. No. 8,979

Int. Cl. B29c *17/02, 17/14;* B29d *23/03*

U.S. Cl. 264—94 **6 Claims**

A hollow thermoplastic parison is sealed off by means of radial pressure applied to a wall of the parison from the plurality of points to form a seal having a plurality of radial fusion lines, while at the same time applying

pressure radially inward along a second plurality of points spaced alternately with the seal-forming plurality of



points to thus fold the wall in at points beneath the fusion lines.

3,663,523

DICARBOXYLIC ACID FROM ROSIN AND PROCESS FOR PREPARING SAME

Bernard A. Parkin, Jr., Walter H. Schuller, and Ray V. Lawrence, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

Filed Oct. 30, 1969, Ser. No. 872,654
Int. Cl. C09f 1/00
U.S. Cl. 260—101 5 Claims

This invention relates to a new dicarboxylic acid and the preparation of same. More particularly, this invention relates to the decarboxylation of rosin in the presence of phosphoric acid and a subsequent reaction of the rosin oil with fumaric acid or maleic anhydride to yield a dicarboxylic acid or anhydride and a stabilized rosin oil.

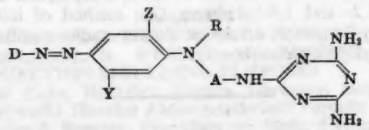
3,663,524

WATER-INSOLUBLE MONAZO-DYESTUFFS CONTAINING A DIAMINO TRIAZINYLAMINO GROUP

Konrad Opitz, Frankfurt am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed June 12, 1970, Ser. No. 45,915
Claims priority, application Germany, July 30, 1969, P 19 38 579.6
Int. Cl. C09b 29/36
U.S. Cl. 260—153 7 Claims

A water-insoluble monoazo-dyestuff of the formula



wherein D represents chlorophenylene, dichlorophenylene, trichlorophenylene, fluorophenylene, bromophenylene, lower alkyl-phenylene, carbo lower alkoxy phenylene, chloro-nitrophenylene, chloro-trifluoromethyl-phenylene, dichloro-nitro-phenylene or chloro-dinitro-phenylene, Y represents hydrogen, chlorine, lower alkyl or acetylamino, Z represents hydrogen or lower alkoxy, R represents hydrogen, lower alkyl or β-hydroxyethyl, and A represents alkylene of from 1 to 6 carbon atoms, said dyestuffs being suitable for the dyeing or printing of polyester fibres, cellulose-2, ½-acetate fibres or cellulose-triacetate-fibres, yielding on these fibres dyeings or prints of high tinctorial strength and brightness and of good fastness to thermofixation and to light.

3,663,525

PREPARATION OF COPPER FORMAZYL DYES

Vincent G. Witterholt, Wilmington, Del., and John W. Dalgarn, Bellmawr, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 6, 1968, Ser. No. 773,951
Int. Cl. C09b 45/18; D06p 3/24
U.S. Cl. 260—149 10 Claims

A process for preparing copper formazyl dyes by reacting alkoxy formazane compounds with a soluble copper salt. The reaction employs certain organic, nitrogen-containing solvents, such as pyridine, 2-methylpyridine, 3-methylpyridine, 4-methylpyridine, formamide, dimethylformamide and dimethylacetamide. When one of the formamides or dimethylacetamide is used, an acid acceptor such as sodium acetate is also added to the reaction medium.

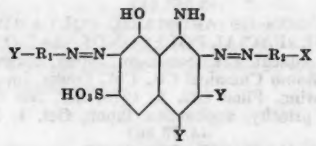
3,663,526

DISAZO DYES CONTAINING AN ALKOXY-HALOGEN-TRIAZINE GROUP

Fritz Oesterlein, Basel, and Karl Seitz, Oberwil, Basel-Land, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Oct. 15, 1969, Ser. No. 866,724
Claims priority, application Switzerland, Nov. 4, 1969, 16,383/69
Int. Cl. C09b 62/08
U.S. Cl. 260—153 6 Claims

A disazo compound of the formula



in which one of the symbols Y represents a hydrogen atom and the other symbol Y represents a sulphonic acid group, R_1 and R_2 each represents an aromatic residue containing a sulphonic acid group, one of the symbols X represents a fibre-reactive alkoxy-halogeno-triazine group bound to the aromatic residue by way of an —NH group, the alkoxy residue containing an etherified alkyl residue, and the other symbol X represents a hydrogen atom or a fibre-reactive acyl residue bound to the aromatic residue by way of an —NH group.

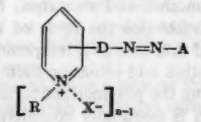
3,663,527

QUATERNARY PYRIDINIUMAZOLEAZO DYESTUFFS

Gert Hegar, Schonenbuch, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed Feb. 25, 1969, Ser. No. 802,227
Claims priority, application Switzerland, Mar. 1, 1968, 3,081/68
Int. Cl. C09b 29/06, 29/08, 29/22
U.S. Cl. 260—156 12 Claims

Azo dyestuffs of the formula



in which A represents the residue of a coupling component free from sulphonic acid and carboxylic acid groups, D represents the residue of a five-membered heterocyclic ring which contains the pyridine residue bound directly to a carbon atom of the ring, R represents an alkyl, aralkyl or cycloalkyl residue, X represents an anion and *n* stands for 1 or 2. The dyestuffs are suitable for dyeing and printing synthetic fibres, which produce intense and level dyeings and printings possessing good fastness properties such as good fastness to light, washing, perspiration and sublimation, and which display good stability in a wide pH range.

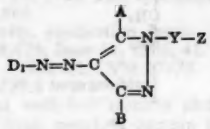
3,663,528

AZO PYRAZOLE DYESTUFFS CONTAINING AN AMINO-, HYDRAZINO- OR ETHERIFIED HYDROXYL-AMINOALKYLENE GROUP WHICH MAY BE QUATERNIZED

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed Apr. 29, 1969, Ser. No. 820,275
Claims priority, application Switzerland, May 13, 1968, 7,078/68
Int. Cl. C09b *29/38;* D06p *3/24*
U.S. Cl. 260—156 **14 Claims**

Basic azo dyestuff of the formula



wherein Y denotes an alkylene chain of up to 6 carbon atoms which may be interrupted by a hetero-atom selected from the group consisting of nitrogen, oxygen or sulfur, A denotes amino or lower alkylamino, B denotes hydrogen, lower alkyl, lower alkoxy or phenyl, Z denotes an amino, hydrazino or etherified hydroxylamino group which may be quaternized, and D_1 is the residue of a diazo component; the new dyestuffs are especially valuable for dyeing synthetic fibers such as polyvinylchloride, polyamide or polyurethane with good general fastness properties, such as fastness to light, washing and sublimation.

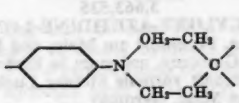
3,663,529

AZO DYESTUFFS CONTAINING A PHENYL-PIPERIDINE COUPLING COMPONENT

Ved Parkash Kubba, Bombay, India, and Visvanathan Ramanathan and Walter Jenny, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed June 13, 1969, Ser. No. 833,144
Claims priority, application Switzerland, June 14, 1968, 8,833/68
Int. Cl. C09b *29/36*
U.S. Cl. 260—156 **2 Claims**

Azo dyestuffs which contain at least one residue of a coupling component of formula



wherein the carbon atom which is located in the 4-position of the azacyclohexane ring is bonded to 1 or preferably 2 identical or mutually different positivising groups which are capable of rendering an adjacent methylene group acid.

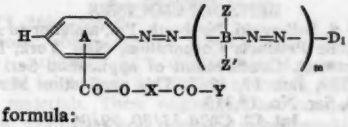
3,663,530

WATER-INSOLUBLE PYRAZOLONE AZO DYESTUFFS

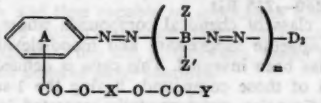
Jean Marie Louis Leroy, Rouen, and Claude Marie Henri Emile Brouard, Sotteville-les-Rouen, France, assignors to Ugine Kuhlmann, Paris, France

No Drawing. Filed Oct. 4, 1968, Ser. No. 765,013
Claims priority, application France, June 26, 1968, 156,564
Int. Cl. C09b *29/38, 31/14;* D06p *3/00*
U.S. Cl. 260—163 **3 Claims**

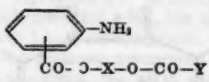
Water-insoluble dyestuffs are provided having the formula:



or the formula:



in which B represents a p-phenylene or p-naphthylene radical linked to the ntirogen atoms, *m* represents the numbers 0 or 1, X represents an alkylene radical having up to 4 carbon atoms, Z and Z' each represent a hydrogen or halogen atom or an alkyl, alkoxy, or acylamino group having up to 4 carbon atoms, Y represents an aliphatic, aryl-aliphatic, aromatic or heterocyclic radical, D_1 represents the residue of a coupling compound of the benzene, diphenyleneoxide, indazole, coumarin, acetylacetarylide, pyrazolone or hydroxy-quinoline series, D_2 represents the residue of a coupling compound of the benzene, diphenylene-oxide, indazole, coumarin, acetylacetarylide, hydroxy-quinoline, 1 - phenyl-3-methyl-pyrazolone or 1-phenyl-3-carbonamidopyrazolone series, the nuclei A, B, D_1, D_2 and Y containing no solubilising acid groups. These dyestuffs are useful for the colouration of hydrophobic textile materials and may be prepared from novel diazotisable bases of the general formula:



in which X, Y, Z and Z' are as defined above. The shades obtained are remarkably fast to thermal fixation, sublimation, creasing, combustion gases, overdyeing, dry cleaning, chlorine and wet tests. The reserve of natural fibres and the dischargeability are good. The fastness to light is remarkable even with light shades and the dyestuffs resist boiling and reduction at temperatures between 80° C. and 220° C.

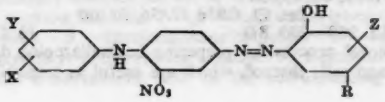
3,663,531

WATER-INSOLUBLE PHENYL-AZO-PHENYL DYESTUFFS

Hans Wilhelm Liechti, Oberwil, Basel-Land, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 655,288, July 24, 1967. This application Aug. 12, 1969, Ser. No. 849,500
Claims priority, application Switzerland, July 29, 1966, 10,998/66
Int. Cl. C07c *107/06;* C09b *29/34*
U.S. Cl. 260—206 **8 Claims**

Nitroazo dyestuffs of the formula



in which X and Y are each hydrogen, chloro, lower alkyl, lower hydroxyalkyl, lower alkoxy, lower hydroxyalkoxy, phenoxy, phenyl-lower alkoxy, lower alkylmercapto, phenylmercapto, or lower alkanoylamino, R is chloro, bromo, lower alkyl, cyclohexyl, phenyl, β-cyanoethyl or lower alkoxy and Z is hydrogen or lower alkyl. The new dyestuffs are useful for dyeing cellulose acetate, cellulose triacetate, polyamide and especially polyester fibers, on which they yield yellow to orange shades of excellent fastness properties.

3,663,532

BENZODIAZOCINES

Theodore S. Sulkowski, Narberth, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation of application Ser. No. 609,779, Jan. 17, 1967. This application Mar. 4, 1970, Ser. No. 15,313

Int. Cl. C07d *53/00, 99/06*

U.S. Cl. 260—239 BD **12 Claims**

A new class of chemical compounds whose members exert an appetite suppressant and mood-elevating effect in man has been invented. This class is defined as being composed of those compounds having the 1-substituted-2,5-benzodiazocine structure, fully saturated in the non-benzenoid portion, and whose nitrogens are tervalent. Members of this class are prepared by condensing an ortho-benzoylbenzoic acid or ester thereof with an ethylenediamine and reducing with a metallic alkaline hydride the product thus obtained.

3,663,533

HYDRAZINE DERIVATIVES

Michio Nakanishi, 756 Shinborimachi, Nakatsu, Oita, Japan; Hiroshi Yuki, 1336 Oaza-Hirotsu, Yoshitomi-machi, Chikujogun, Fukuoka, Japan; and Tomio Muro, 2275 Kanaya-Uenocho, Nakatsu, Oita, Japan

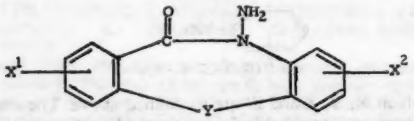
No Drawing. Filed May 6, 1970, Ser. No. 35,233

Claims priority, application Japan, May 6, 1969, 44/34,952

Int. Cl. C07d *93/42, 87/54, 53/00*

U.S. Cl. 260—239.3 **15 Claims**

Hydrazine derivatives of the formula



and pharmaceutically acceptable, acid-addition salts thereof, and wherein X^1 is H or Cl, X^2 is H, Cl, CH_3O or CF_3 and Y is —O—, —S—, —SO_2—, —NH—, —N(CH_3)—, —CO—, —CH_2—, —CH(CH_3)— or —$C(CH_3)_2$— are useful as antiepileptic agents.

3,663,534

PROCESS FOR PREPARING BENZODIAZEPINE DERIVATIVES AND SALTS THEREOF

Hisao Yamamoto, Nishinomiya-shi, Shigeho Inaba, Takarazuka-shi, Tadashi Okamoto and Toshiyuki Hirohashi, Ashiya-shi, Kikuo Ishizumi, Minoo-shi, Michihiro Yamamoto, Toyonaka-shi, Isamu Maruyama, Minoo-shi, Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

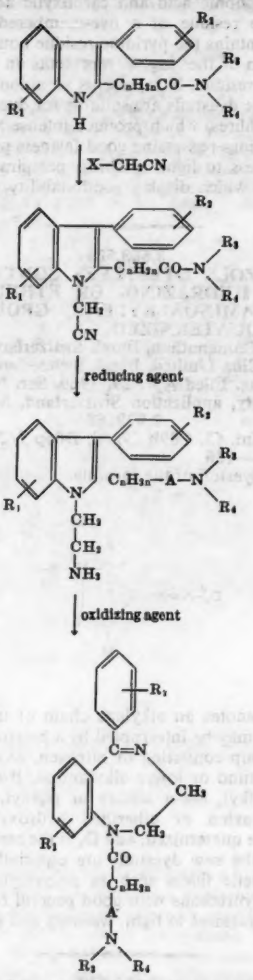
No Drawing. Filed Jan. 19, 1970, Ser. No. 4,040

Claims priority, application Japan, Jan. 25, 1969, 44/5,573, 44/5,574, 44/5,575; Apr. 18, 1969, 44/30,604; May 13, 1969, 44/37,159; June 9, 1969, 44/45,690

Int. Cl. C07d *27/56, 53/06*

U.S. Cl. 260—239 BD **13 Claims**

A novel process for preparing benzodiazepine derivatives and salts thereof, which are useful as tranquilizers, muscle-relaxants, antispasmodics and hypnotics. This process is shown by reaction scheme as follows:



wherein R_1 and R_2 signify individually hydrogen atom, halogen atom, lower alkyl group having up to 4 carbon atoms, lower alkoxy group having up to 4 carbon atoms, trihalomethyl group, nitro group or amino group; R_3 and R_4 signify individually hydrogen atom or lower alkyl group having up to 4 carbon atoms; and A signifies a carbonyl group or a methylene group, *n* signifies 0, 1 or 2, and X signifies a halogen atom. Among these compounds, benzodiazepine derivatives wherein *n* is O and A is a carbonyl group are novel compounds.

3,663,535

4-ACYLOXY-AZETIDINE-2-ONES

Herbert Bestian, Frankfurt am Main, and Dieter Grimm, Wiesbaden, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Jan. 23, 1970, Ser. No. 5,346

Claims priority, application Germany, Feb. 8, 1969, P 19 06 401.8

Int. Cl. C07d *25/02*

U.S. Cl. 260—239 A **9 Claims**

4-acyloxy-azetidine-2-ones are obtained by reacting vinyl esters with chlorosulfonyl isocyanate. The products

are starting compounds for syntheses of compounds containing the β-lactam ring and are useful as acid-yielding agents, especially for printing inks.

3,663,536

1,5-DIAZACYCLONONANES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Original application July 21, 1966 ,Ser. No. 566,751, now Patent No. 3,497,513, dated Feb. 24, 1970. Divided and this application Nov. 13, 1969, Ser. No. 876,578

Int. Cl. C07d *53/00*

U.S. Cl. 260—239 BC **4 Claims**

Substituted 1,5-diazacyclononanes are prepared by treating substituted 1,5-diazabicyclo[4.3.0]nonanes with sodium in the presence of liquid ammonia and are useful as central nervous system stimulants and antidepressants.

3,633,537

LIGHT-FAST AND WASH-FAST REACTIVE PHTHALOCYANINE DYES

Hirohito Kenmochi, Toyonaka-shi, Seiji Hotta, Minoo-shi, and Takashi Akamatsu, Ashiya-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

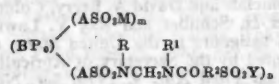
No Drawing. Continuation-in-part of application Ser. No. 561,064, June 28, 1966. This application Nov. 10, 1969, Ser. No. 875,566

Claims priority, application Japan, July 1, 1965, 40/39,475; June 11, 1966, 41/37,945

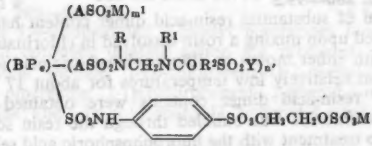
Int. Cl. C07d *27/76*

U.S. Cl. 260—239.6 **14 Claims**

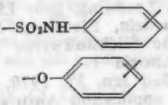
Light-fast and wash-fast reactive phthalocyanine dyes which are free from metal or contain metal represented by the following general formula,



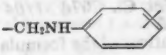
or



wherein P_c means the residue of phthalocyanine; B represents 2H or a divalent metal in the center of the phthalocyanine molecule; A means direct linkage or a bisvalent radical selected from the group consisting of



and



(the benzene ring may be substituted with methyl or methoxy radical); R means hydrogen atom, an alkyl radical having 1 to 4 carbon atoms of β-sulfatoethyl radical; R^1 means hydrogen atom or an alkyl radical having 1 or 2 carbon atoms; R^2 means an alkylene radical having 1 or 2 carbon atoms; Y means β-sulfatoethyl or vinyl radical; M means hydrogen atom or an alkali metal; *m* and *n* means respectively a number of 1 to 3, provided that the total number of *m* and *n* is 2 to 4; and *m'* and *n'* mean respectively a number of 1 to 2, provided that the total number of *m'* and *n'* is 2 to 3.

3,663,538

CATIONIC DERIVATIVES OF 4,4' - BIS-(s-TRIAZINYLAMINO)-STILBENE - 2,2'-DISULFONIC ACID, PROCESS FOR THE PREPARATION THEREOF AND APPLICATION AS OPTICAL BRIGHTENERS

Karl Heinz Lebkücher, Hofheim, Taunus, Ehrenfried Nischwitz, Kelkheim, Taunus, and Erich Schinzel, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 7, 1969, Ser. No. 839,640

Claims priority, application Switzerland, July 22, 1968, 10,953/68

Int. Cl. C07d *55/22*

U.S. Cl. 260—240 B **10 Claims**

Cationic compounds of the 4,4' - bis - (s - triazinylamino) - stilbene - 2,2' - disulfonic acid series are useful as optical brighteners for fibrous materials, especially cellulose materials. These brighteners are compatible with cationic auxiliaries and operative when working at low pH values and thus capable of application together with cation-active laundry refining agents or crease-resistant finishing agents. They are, furthermore, useful for brightening paper pulps or paper coatings.

3,663,539

PROCESS FOR THE MANUFACTURE OF BASIC OXAZINE DYESTUFFS

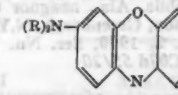
Gustav Schafer and Norbert Ottawa, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Feb. 13, 1969, Ser. No. 799,086

Int. Cl. C07d *87/50*

U.S. Cl. 260—242 **4 Claims**

In the process for the manufacture of basic oxazine dyestuffs of the formula



in which R represents an alkyl group from 1 to 4 carbon atoms and $X^{(-)}$ represents Cl^- or $ZnCl_3^-$ by treating a dialkyl-m-aminophenol-alkyl ether, the alkyl groups herein containing from 1 to 4 carbon atoms, with nitrous acid and condensing the p-nitroso compound so obtained with a dialkyl-m-amino-phenol, the alkyl groups herein containing from 1 to 4 carbon atoms, the improvement which comprises condensing the suspension of the p-nitroso compound obtained as described above with the said dialkyl-m-amino-phenol without being intermediately isolated.

3,663,540

7 - (p-AMINOMETHYLPHENYLTHIO)ACETAMIDO-3 - (PYRIDINIUMMETHYL)CEPH - 3 - EM - 4-CARBOXYLATE

Raymond Urgel Lemieux and Rintje Raap, Edmonton, Alberta, Canada, assignors to R & L Molecular Research Ltd., Edmonton, Alberta, Canada

No Drawing. Filed June 19, 1970, Ser. No. 47,915

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **4 Claims**

7 - (p - aminomethylphenylthio)acetamido-3-(pyridiniummethyl)ceph-3-em-4-carboxylate and its nontoxic, pharmaceutically acceptable salts are valuable as antibacterial agents, as nutritional supplements in animal feeds and as therapeutic agents in poultry and animals, including man, and are especially useful in the treatment of infectious diseases caused by many gram-positive and gram-negative bacteria. 7 - (p - aminomethylphenylthio) - acetamido - 3 - (pyridiniummethyl)ceph - 3 - em - 4-carboxylate is prepared, for example by treatment at 0° C. with trifluoroacetic acid of the corresponding com-

pound in which the free amino group is protected with a tert.-butoxycarbonyl group.

3,663,541

REACTIVE ANTHRAQUINONE DYESTUFFS CONTAINING A TOLYLSULFONYLMETHYLENE OXYTRIAZINE GROUP

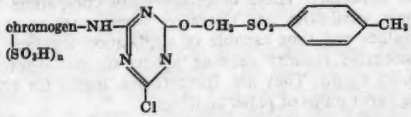
Angelo Mangini, Antonio Tundo, and Bianca Flavia Bonini, Bologna, and Marta Rossetti, Milan, Italy, assignors to Aziende Colori Nazionali Affini ACNA S.p.A., Milan, Italy

No Drawing. Original application Mar. 21, 1966, Ser. No. 536,144, now Patent No. 3,527,747, dated Sept. 8, 1970. Divided and this application Mar. 31, 1970, Ser. No. 24,343

Int. Cl. C07d *55/46*

U.S. Cl. 260—249 2 Claims

Reactive triazine dyestuffs having the formula:



wherein chromogen is an anthraquinone dyestuff residue and *n* is an integer from 1 to 4, are particularly effective for dyeing cellulose. The dyestuffs may be absorbed and fixed onto the cellulose fibers by hot or cold dyeing techniques. The dyestuffs have high reactivity and good dyeing power and the dyeings obtained therefrom have high brilliance and purity of chromatic shades and improved fastness to washing.

3,663,542

PROCESS FOR THE PREPARATION OF ALKOXY-BIS(ALKYLAMINO)-s-TRIAZINES

Howard V. Lemaster, Mobile, Ala., assignor to Geigy Chemical Corporation, Greenburgh, N.Y.

No Drawing. Filed Oct. 2, 1970, Ser. No. 77,676

Int. Cl. C07d *55/20*

U.S. Cl. 260—249.8 10 Claims

A method for the preparation of alkoxy-bis(alkylamino)-s-triazines by reacting halogeno-bis(alkylamino)-s-triazines with aliphatic alcohols at elevated pressures in the presence of a slight excess of alkali.

3,663,543

2,3-DICHLORO-5,10-DIHYDROPYRAZINO(2,3-b) QUINOXALINE

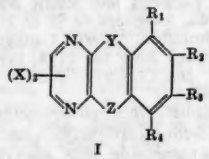
Aylin H. Gulbenk, Walnut Creek, Dorothy J. Horne, Piedmont, and Howard Johnston, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 2, 1970, Ser. No. 9,260

Int. Cl. C07d *51/76, 51/78*

U.S. Cl. 260—250 R 2 Claims

Halogenated, tricyclic pyrazino compounds having the general structure:



I

wherein the X's independently, in each occurrence, represent hydrogen or halogen, Y and Z independently are

$$-S-,\quad -O-\quad \text{or}\quad -\overset{|}{N}R$$

(where R is hydrogen or alkyl), and R_1, R_2, R_3 and R_4 are independently hydrogen, alkyl or halogen. Said compounds are prepared by reacting the appropriate polyhalopyrazine compound with a benzene compound which is ortho-substituted by two groups selected from hydroxy, mercapto and/or amino radicals. The compounds are variously useful as pesticides for the control of plant, insect and other organisms.

3,663,544

NOVEL PHOSPHORIC ACID AMIDE ESTERS

Karlheinz Milzner, Basel, and Fritz Reisser, Therwil, Basel-Land, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

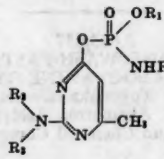
No Drawing. Filed July 23, 1970, Ser. No. 57,815

Claims priority, application Switzerland, Aug. 1, 1969, 11,727/69; Oct. 21, 1969, 15,708/69; Jan. 19, 1970, 674/70

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 E 9 Claims

Novel phosphoric acid amide esters of the formula:



wherein R_1 is alkyl of 1 to 4 carbon atoms, R_2 is alkyl of 1 to 4 carbon atoms, R_3 is hydrogen or alkyl of 1 to 4 carbon atoms, and R_4 is hydrogen or alkyl of 1 to 4 carbon atoms, which possess pesticidal properties, or more particularly insecticidal, acaricidal and ovicidal properties.

3,663,545

DIMERIZATION OF ROSIN

Richard G. Sinclair and David A. Berry, Columbus, Ohio, and Walter H. Schuller and Ray V. Lawrence, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Apr. 9, 1970, Ser. No. 27,174

Int. Cl. C08h *11/04*

U.S. Cl. 260—99.5 9 Claims

Rosin of substantial resin-acid dimer content has been produced upon mixing a rosin dissolved in chlorinated solvent with either mono- or difluorophosphoric acid and reacting at relatively low temperatures for about 17 hours. Higher resin-acid dimer contents were obtained when boron trifluoride was bubbled through the resin solution prior to treatment with the fluorophosphoric acid selected.

3,663,546

PROCESS FOR THE PREPARATION OF PYRIDAZONE DERIVATIVES

Rupert Schönbeck, Leonding, near Linz (Danube), and Engelbert Kloimstein, Eferding, Austria, assignors to Osterreichische Stickstoffwerke Aktiengesellschaft, Linz (Danube), Austria

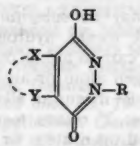
No Drawing. Filed Jan. 27, 1970, Ser. No. 6,312

Claims priority, application Austria, Feb. 6, 1969, A 1,181/69

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A 8 Claims

Pyridazone derivatives of the formula



(I)

in which X and Y each are hydrogen, chloride, bromine and lower alkyl or X and Y together are the group

$$-CH=CH-CH=CH- \qquad \text{(II)}$$

and R is hydrogen or lower alkyl, optionally substituted by phenyl or the cyano group were prepared by reacting maleic acid or anhydride, or its substitution products with the acid solution of a hydrazine $H_2N—NHR$, which was prepared by treating crude solutions containing said hydrazine as the base at the boil with aliphatic ketones, which at normal temperature are liquid and water-immiscible, separating the organic layer and decomposing this layer with an aqueous mineral acid, optionally in presence of the maleic acid or anhydride or its substitution products respectively.

3,663,547

2,3,4,5 - TETRAHYDRO-3-HYDROXY-6-PHENYL-2-SULFONYLPYRIDAZINE - 3 - PROPIONIC ACID γ-LACTONES AND CONGENERS

William K. Sprenger, Niles, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 53,335, July 8, 1970. This application July 31, 1970, Ser. No. 60,113

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A 17 Claims

Disclosed herein are analgesic, anti-ulcerogenic, and anti-protozoal 2,3,4,5-tetrahydro - 3 - hydroxy-6-phenyl-2-sulfonylpyridazine-3-propionic acid γ-lactones and congeners; anti-ulcerogenic, pepsin-inhibiting; anti-bacterial, and anti-protozoal 5-phenyl-1-sulfonamidopyrrole-2-propionic acids and congeners; and the preparation of these compounds from corresponding 4,7-dioxoheptanoic acids and sulfonic acid hydrazides.

3,663,548

1,4-DISUBSTITUTED 2-PHENYL PIPERAZINES

Yoshihiro Nitta, Yoshiaki Ikeda, and Toshiyuki Furue, Tokyo, Akitoshi Shioya, Saitama-ken, and Shigeru Sugano and Yasuyuki Shiraki, Tokyo, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed June 26, 1968, Ser. No. 740,071
Claims priority, application Japan, June 29, 1967, 42/41,303; July 28, 1967, 42/48,183

Int. Cl. C07d *51/72*

U.S. Cl. 260—268 R 4 Claims

Novel 1,4-disubstituted 2-phenyl piperazines having a powerful coronary dilating action are produced. These compounds include 1-(p-chlorobenzyl)-2-phenyl-3,4-dimethyl piperazine; 1-(p-chlorobenzyl)-2-phenyl-4-methyl piperazine; and 1-(p-chlorobenzyl)-2-phenyl-4-ethyl piperazine.

3,663,549

METHOD OF MAKING DIARYL HYDROXYETHYL TERTIARY AMINES

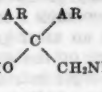
Raymond John Michaels, Jr., Mundelein, and Harold Elmer Zaugg, Lake Forest, Ill., assignors to Abbott Laboratories, Chicago, Ill.

No Drawing. Original application May 10, 1967, Ser. No. 637,350. Divided and this application Oct. 6, 1969, Ser. No. 870,925

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 TR 4 Claims

A novel series of diaryl hydroxyethyl tertiary amines represented by general Formulae I and II

I 

II

wherein AR represents an aryl radical, NR_2 signifies a tertiary amine in Formula I, and X represents O, S, $—NCH_3$, $—CH_2—CH_2—$, —CH=CH— and a direct single bond, NR_2 is as previously described in Formula II. The novel method for making these compounds comprises first reacting the appropriate diaryl ketone with an alkali metal reducing agent, followed by alkylation with a sodium formaldehyde bisulphite derivative of a secondary amine to yield the final product. The compounds made according to this novel process are useful as antispasmodic agents.

3,663,550

2-LOWER ALKYL-2,3-DIHYDROTHIENO[3,2-c] QUINOLINE OXIDES

Yasuo Makisumi, Amagasaki-shi, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Filed Dec. 9, 1969, Ser. No. 883,613
Claims priority, application Japan, Dec. 25, 1968, 43/95,190; Dec. 28, 1968, 44/296, 44/297

Int. Cl. C07d *63/18*

U.S. Cl. 260—283 S 8 Claims

2-lower alkyl - 2,3-dihydrothieno[3,2-c]quinoline oxides and pharmaceutically acceptable non-toxic salts thereof synthesized from 2-lower alkyl-2,3-dihydrothieno[3,2-c]quinolines or 3-(2-halogeno-lower alkyl)-4-halogenoquinoline 1-oxides, showing strong hypothermic, analgesic and anti-inflammatory activities with low toxicities.

3,663,551

PRODUCTION OF ISOCARBOSTYRILS

Antoon M. Deryckere, Uccle, and Fernand J. F. Eloy, Rhode-Saint-Genese, Belgium, assignors to Union Carbide Corporation

No Drawing. Filed July 5, 1968, Ser. No. 742,531

Int. Cl. C07d *35/30*

U.S. Cl. 260—283 SY 7 Claims

Isocarbostyrils are produced by heating styryl isocyanates, many of which are new compounds.

3,663,552

2'-SUBSTITUTED-CINCHONA ALKALOIDS

John P. Yardley, King of Prussia, Royal E. Bright, Philadelphia, Richard W. Rees, Newtown Square, and Herchel Smith, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 692,277, Dec. 21, 1967. This application Apr. 9, 1970, Ser. No. 27,119

Int. Cl. C07d *43/24*

U.S. Cl. 260—284 12 Claims

2'-substituted alkaloids of the cinchona series, especially 2'-substituted quinine, quinidine, cinchonine, cinchonidine and dihydro analogs of Formulas I and II, and their salts, are prepared by treating ar-N-oxides of the alkaloids with the corresponding organometallic reagent and, if desired, converting the free bases thus formed into pharmaceutically-acceptable acid-addition salts. The new compounds are pharmacologically active, especially antimalarially and anti-arrhythmically.

3,663,553

DI-SILVER AMINOTETRAZOLE PERCHLORATE

Charles T. Rittenhouse, Glendale, Ariz., assignor to Unidynamics/Phoenix, Goodyear, Ariz.

No Drawing. Filed Feb. 12, 1969, Ser. No. 798,775

Int. Cl. C06c *1/00;* C07f *1/10*

U.S. Cl. 260—299 1 Claim

A new composition of matter, di-silver aminotetrazole perchlorate, is useful as a primary explosive for initiating secondary explosives such as TNT, HNS, DIPAM, and the like. The compound is stable at 500° F. for upwards of 50 hours.

3,663,554

PREPARATION OF β-COLLIDINE

Juerg Albert Walter Gutzwiller, Bloomfield, and Milan Radoje Uskokovic, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Jan. 22, 1968, Ser. No. 699,334. Divided and this application Mar. 27, 1970, Ser. No. 23,503

Int. Cl. C07d *31/08*

U.S. Cl. 260—290 P 5 Claims

The preparation of β-collidine from methyl vinyl ketone and an amine such as, for example, benzylamine, through various intermediates, for example, 3-acetyl-1-benzyl - 1,2,5,6 - tetrahydro-4-methylpyridine, 3-acetyl-1,2,5,6 - tetrahydro - 4 - methylpyridine, 3 - acetyl-4-methylpyridine, 1 - benzyl - 3 - (1-hydroxyethyl)-1,2,5,6-tetrahydro - 4 - methylpyridine, 3-(1-hydroxyethyl)-4-methylpyridine and 1-benzyl-3-ethylene-1,2,3,6-tetrahydro - 4-methylpyridine, is described. β-Collidine, i.e., 3-ethyl-4-methylpyridine, is useful in the synthesis of, for example, dihydroquinidine.

3,663,555

METHOD FOR PREPARING 3-HYDROXY-2-IMINO-1(2H) - PYRIDINE-SULFONIC ACID MONOHYDRATE

John Valdemar Brammer Petersen and Niels Clauson-Kaas, Farum, Denmark, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Application June 25, 1968, Ser. No. 751,650, now Patent No. 3,553,224, dated Jan. 5, 1971, which is a division of application Ser. No. 544,685, Apr. 25, 1966, now Patent No. 3,419,570, dated Dec. 31, 1968. Divided and this application Aug. 19, 1970, Ser. No. 65,337

Claims priority, application Switzerland, Apr. 29, 1965, 5,938/65, 5,939/65, 5,940/65

Int. Cl. C07d *31/48*

U.S. Cl. 260—294.8 R 5 Claims

3-hydroxy-2-imino-1(2H)-pyridine-sulfonic acid monohydrate is prepared from furfural, a chlorinating agent and sulfaminic acid.

3,663,556

METHOD FOR PREPARING ALKALI METAL SALTS OF 3-HYDROXY - 2-OXO-1(2H)-PYRIDINE-SULFONIC ACID

John Valdemar Brammer Petersen and Niels Clauson-Kaas, Farum, Denmark, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Application June 25, 1968, Ser. No. 751,650, now Patent No. 3,553,224, Jan. 5, 1971, which is a division of application Ser. No. 544,685, Apr. 25, 1966, now Patent No. 3,419,570, dated Dec. 31, 1968. Divided and this application Aug. 19, 1970, Ser. No. 65,327

Claims priority, application Switzerland, Apr. 29, 1965, 5,938/65, 5,939/65, 5,940/65

Int. Cl. C07d *34/48*

U.S. Cl. 260—294.8 R 4 Claims

Alkali metal salts of 3-hydroxy-2-oxo-1(2H)-pyridine-sulfonic acid are prepared from furfural, a chlorinating agent, sulfaminic acid and an alkali metal ion-donating agent.

3,663,557

BIOLOGICALLY ACTIVE FORMS OF PYRIDOXINE COENZYMES

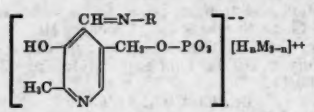
Edmond Forget, Sierne-Geneva, Switzerland, assignor to Etablissement Kogerim, Vaduz, Liechtenstein

No Drawing. Original application June 8, 1966, Ser. No. 555,991, now Patent No. 3,462,529, dated Aug. 19, 1969. Divided and this application Dec. 4, 1968, Ser. No. 833,205

Int. Cl. C07d *31/36, 31/44*

U.S. Cl. 260—295 VB 4 Claims

Biologically active forms of pyridoxine coenzymes possessing all the pharmacological properties of vitamin B_6 have the general formula:



in which R is such that RNH_2 represents a monoamino acid or diamino acid containing one or two carboxyl groups, or, an ester of such acid, or an amide of such acid; *n* is a number assuming the value 0 when RNH_2 is a monoamino or diamino dicarboxylic acid and the value 1 in other cases; and M represents an alkali metal. These coenzymes are prepared by contacting together at room or ambient temperature and in an alcoholic medium the RNH_2 derivative, pyridoxal-5'-monophosphate and an alkaline base in substantially the stoichiometric proportions corresponding to the general formula as defined above.

3,663,558

Δ^3 PIPERIDONE ENOL ETHERS AND A PROCESS FOR THEIR PREPARATION

Keisuke Murayama, Toshimasa Toda, Eiko Yamao, Katsuaki Matsui, Tomoyuki Kurumada, Noriyuki Ohta, and Ichiro Watanabe, Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

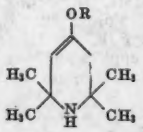
No Drawing. Filed Sept. 15, 1970, Ser. No. 72,522

Claims priority, application Japan, Sept. 27, 1969, 44/77,258; Nov. 4, 1969, 44/88,262

Int. Cl. C07d *31/28*

U.S. Cl. 260—297 R 6 Claims

New piperidone enol ethers having the formula



wherein R represents an alkyl group of 1–18 carbon atoms; a cycloalkyl group which contains 5 or 6 carbon atoms and may be substituted with an alkyl group of 1–4 carbon atoms or hydroxyl group; or the group of the formula —CH_2—R' in which R' represents an aryl group which contains 6–10 carbon atoms and may be substituted with an alkyl group of 1–4 carbon atoms, an alkoxy group of 1–4 carbon atoms, a halogen atom or hydroxyl group in the aryl moiety or a 5- or 6-membered heterocyclic group which contains oxygen atom as a hetero atom and may be substituted with an alkyl group of 1–4 carbon atoms, an alkoxy group of 1–4 carbon atoms, a halogen atom or hydroxyl group. These piperidone enol ethers

are prepared by reacting triacetonamine with an alcohol having the formula

R—OH

wherein R is as defined above in the presence of an acid catalyst. These piperidone enol ethers exhibit a superior stabilizing effect against photo- and thermo-deterioration of various synthetic polymers and thus they are useful as a stabilizer for synthetic polymers.

3,663,559

PREPARATION OF OXO-FURO-PYRIDINES FROM FURYLVINYL ISOCYANATES

Antoon M. Derijckere, Uccle, and Fernand G. F. Eloy, Rhode-Saint-Genese, Belgium, assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 788,318, Dec. 31, 1968, which is a continuation-in-part of application Ser. No. 742,531, July 5, 1968. This application Dec. 3, 1969, Ser. No. 881,872

Int. Cl. C07d *31/32*

U.S. Cl. 260—297 B **10 Claims**

Condensed pyridones are prepared by heating, for example, 2-(furyl)-, 2-(thienyl)-, or 2-(pyrrolyl)vinyl isocyanates. For instance, 4,5-dihydro-4-oxo-furo[3,2-c]pyridines are produced by heating 2-(2-furyl)vinyl isocyanates, 1,2-dihydro-1-oxo-benzothieno[2,3-c]pyridines are prepared by heating 2-(3-benzothienyl)vinyl isocyanates, and 4,5-dihydro-4-oxo pyrrolo[3,2-c]pyridines are prepared by heating 2-(pyrrolyl)vinyl isocyanates. The condensed pyridones are transformed into various derivatives by utilizing known types of reactions. The pyridones and their derivatives are useful reaction intermediates.

3,663,560

PYRAZOLYL-TRIAZOLYL COUMARINS

Carl-Wolfgang Schellhammer, Opladen, Alfons Dorlars, Leverkusen, and Wolf-Dieter Wirth, Cologne-Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 13, 1968, Ser. No. 728,800

Claims priority, application Germany, May 22, 1967, F 52,479

Int. Cl. C07d *99/04*; C09k *1/02*

U.S. Cl. 260—299 **2 Claims**

7 - [pyrazolyl - (1)]-3-[1,2,4-triazolyl-(1)-]-coumarins and their quaternization products, adapted for use as brightening agents, are prepared by condensing 7-hydrazino-3-[1,2,4-triazolyl(1)]-coumarins with 1,3 - dicarbonyl compounds and optionally quaternizing that product.

3,663,561

2-HYDROCARBYLDITHIO - 5 - MERCAPTO-1,3,4-THIADIAZOLES AND THEIR PREPARATION

Eli W. Blaha, Highland, Ind., assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 643,794, May 19, 1967. This application Dec. 29, 1969, Ser. No. 888,808

Int. Cl. C07d *91/62*

U.S. Cl. 260—302 SD **6 Claims**

Novel and useful 2-hydrocarbyldithio-5-mercapto-1,3,4-thiadiazoles are prepared by oxidation coupling of equal molecular portions of a hydrocarbyl mercaptan and 2,5-dimercapto-1,3,4-thiadiazole or its alkali metal mercaptide. 2-hydrocarbyldithio - 5 - mercapto-1,3,4-thiadiazoles are unusual scavengers of elemental sulfur, for example one mole can deactivate 100 atoms of elemental sulfur at a temperature of about 210° F. and 25 atoms of elemental sulfur at about 300° F. The sulfur deactivation makes 2-hydrocarbyldithio-5-mercapto-1,3,4-thiadiazoles useful for preventing copper corrosion by active sulfur. Illustrative of 2-hydrocarbyldithio-5-mercapto-1,3,4-thiadiazoles are those having as the hydrocarbyl substituent alkyl, cycloalkyl, alkaryl and aralkyl groups.

3,663,562

PROCESS FOR THE PRODUCTION OF 2-MERCAPTO-BENZOTHIAZOLE

Helmut Magerlein and Hans-Dieter Rupp, Erlenbach, and Gerhard Meyer, Obernburg, Germany, assignors to Glanzstoff AG, Wuppertal, Germany

No Drawing. Filed Apr. 10, 1970, Ser. No. 27,418

Claims priority, application Germany, Apr. 17, 1969, P 19 19 420.8

Int. Cl. C07d *91/48*

U.S. Cl. 260—306 **5 Claims**

Process for the production of 2-mercapto-benzothiazole by reacting aniline and elementary sulfur with trithiane at an elevated temperature and preferably under superatmospheric pressure. The product is obtained in good yields and purity and is known to be useful as a vulcanization accelerator.

3,663,563

ESTERS OF 6-AMINOPENICILLANIC ACID

George Robert Fosker, Horsham, Sussex, and John Herbert Charles Nayler, Dorking, Surrey, England, assignors to Beecham Group Limited, Brentford, England

No Drawing. Filed July 22, 1969, Ser. No. 843,744

Claims priority, application Great Britain, July 26, 1968, 35,771/68; Feb. 13, 1969, 7,757/69

Int. Cl. C07d *99/14*

U.S. Cl. 260—306.7 **6 Claims**

Esters of 6-aminopenicillanic and are disclosed. These have utility as intermediates in the preparation of semi-synthetic penicillins.

3,663,564

URAZOLES AND THEIR PRODUCTION

Charles R. Jacobson, Orange, Anthony D'Adamo, East Orange, and Charlotte E. Cosgrove, West Orange, N.J., assignors to Knoll Pharmaceutical Company, Orange, N.J.

No Drawing. Filed June 19, 1958, Ser. No. 742,994

Int. Cl. A61k *27/00*; C07d *55/06*

U.S. Cl. 260—308 C **19 Claims**

A phenyl-substituted urazole and a method of making urazoles. The urazoles are drugs, especially anticonvulsants.

3,663,565

ESTERS AND AMIDES OF 3-PHENYL-ADAMANTANE-1-CARBOXYLIC ACID

Carl Peter Krimmel, Wauconda, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed July 2, 1969, Ser. No. 838,644

Int. Cl. C07c *103/44*

U.S. Cl. 260—326.3 **5 Claims**

Dialkylaminoalkyl amides, esters, thioamides, and thioesters of 3-phenyladamantane-1-carboxylic acid are described herein. They possess anti-bacterial, anti-protozoal, anthelmintic, anti-fungal, anti-algal, and anti-viral activity. The compounds are prepared from 3-phenyladamantane-1-carboxylic acid or the corresponding acid chloride.

3,663,566

1-(3-PHENOXY-2-BENZOYLAMINO)-PROPYL-PYRROLIDINES

Roland-Yves Mauvernay, Riom, Norbert Busch, Loubeyrat, Jacques Simond, Chamalieres, and Jacques Moleyre, Mozac, France, assignors to Centre Europeen de Recherches Mauvernay C.E.R.M.

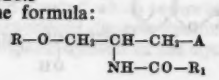
No Drawing. Filed July 16, 1969, Ser. No. 842,388

Claims priority, application France, July 17, 1968, 159,466

Int. Cl. C07d *27/04*

U.S. Cl. 260—326.3 **5 Claims**

Amides of the formula:



wherein R is an alkyl, alkenyl, alkynyl, aryl or arylalkyl radical, all of which may be unsubstituted or substituted, A is a tertiary amine group included in a heterocyclic group, and R_1 is an aromatic radical which may be substituted in the nucleus, or an arylalkyl radical, and their addition salts with physiologically acceptable acids, have valuable cardiovascular properties, and are suitable for therapeutic use.

3,663,567

N-SUBSTITUTED CYCLOALKANOINDOLES

Marcel K. Eberle, Madison, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 866,020, Oct. 13, 1969. This application Dec. 4, 1970, Ser. No. 95,407

Int. Cl. C07d *27/54*

U.S. Cl. 260—326.9 12 Claims

The invention discloses novel process for preparation of N-substituted cycloalkanoindoles including novel compounds of said type exhibiting pharmaceutical activity in animals and also useful as intermediates.

3,663,568

BENZO-TRIS-THIOPHENES

Ernst Roos and Klaus Wagner, Cologne, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 9, 1969, Ser. No. 883,635

Claims priority, application Germany, Jan. 16, 1969, P 19 02 050.9

Int. Cl. C07d *63/22*

U.S. Cl. 260—330.5 2 Claims

Novel benzothiophene derivatives are obtained by reacting an aromatic o-chloro-aldehyde in the presence of an acid binding agent with a mercaptomethyl compound.

The new compounds obtainable according to this process are useful as light protective agents for polyvinyl chloride.

3,663,569

PROCESS FOR PREPARING CYCLIC CARBONATES FROM POLYHYDRIC ALCOHOLS

Baak W. Lew, Wilmington, Del., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

No Drawing. Filed Sept. 2, 1969, Ser. No. 854,752

Int. Cl. C07d *13/04, 13/06, 15/04*

U.S. Cl. 260—340.2 2 Claims

Polyhydric alcohol cyclic carbonates are prepared by the transesterification reaction of a polyhydric alcohol of at least four carbon atoms containing at least four hydroxyl groups with a dialkyl or diaryl carbonate in the presence of a dialkyl or diaryl tin oxide catalyst.

3,663,570

COUMARIN DERIVATIVES

Yasunobu Sato, Yutaka Kobayashi, Hiromu Takagi, Seiji Kumakura, Koichi Nakayama, and Takeshi Oshima, Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

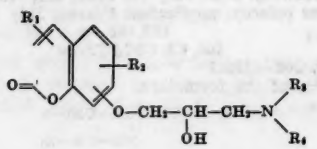
No Drawing. Filed Apr. 23, 1970, Ser. No. 31,380

Claims priority, application Japan, Apr. 28, 1969, 44/32,578; Oct. 27, 1969, 44/85,820

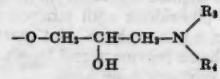
Int. Cl. C07d *7/26*

U.S. Cl. 260—343.2 R 11 Claims

The application is directed to a novel coumarin derivative having the formula

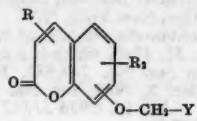


wherein R_1, R_2 and R_3 may be the same or different and each represents a hydrogen atom or a lower alkyl group, R_4 represents a lower alkyl group and the group

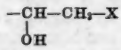


is substituted in 5- or 8-position of the coumarin ring and a process for the preparation thereof.

The coumarin derivative is useful as β-adrenergic blocking agents and prepared by reacting compound having the formula



wherein R_1 and R_2 are the same as above, Y represents a group



(wherein X represents a halogen atom) or 2-oxiranyl group and the group $—O—CH_2—Y$ is substituted in 5- or 8-position of the coumarin ring with an amine having the formula

wherein R_3 and R_4 are the same as above in the presence or absence of a solvent.

3,663,571

LACTONE COMPOUND AND PROCESS FOR PREPARATION THEREOF

Shiro Kimura, Teruo Kobayashi, and Sadao Ishige, Kanagawa, and Masatak Kiritani, Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

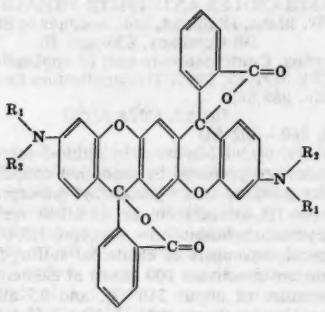
No Drawing. Filed June 24, 1970, Ser. No. 49,510

Claims priority, application Japan, June 27, 1969, 44/50,820

Int. Cl. C07d *5/46*

U.S. Cl. 260—343.3 5 Claims

A novel lactone having the general Formula I



wherein R_1 and R_2 each is an alkyl group having from 1 to 5 carbon atoms or a benzyl group and a process for its preparation is disclosed. The lactone is useful in copying papers.

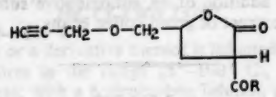
3,663,572

SUBSTITUTED 4-PROPARGYLOXYMETHYL-γ-BUTYROLACTONES

Claude P. Fauran, Guy M. Raynaud, and Colette A. Douzon, Paris, and Claude J. Gouret, Meudon, France, assignors to Delalande S.A., Courbevoie, Hauts-de-Seine, France

No Drawing. Filed Aug. 20, 1969, Ser. No. 851,757
Claims priority, application Great Britain, Sept. 17, 1968, 44,025/68
Int. Cl. C07d 5/06
U.S. Cl. 260—343.6 5 Claims

A compound of the formula



in which R is a straight or branched-chain aliphatic hydrocarbon radical having 1 to 4 carbon atoms, alkoxy, optionally substituted aryl,

in which R_1 and R_2 are aliphatics having 1 to 4 carbon atoms, or a heterocyclic radical. The compound is prepared by reacting 1-propargyloxy-2,3-epoxy propane with

in which R has the same meaning as above and R′ is an alkoxy. The compounds possess tranquilizing, analgesic and hypotensive properties.

3,663,573

EPOXIDES DERIVED FROM SUBSTITUTED ACRYLAMIDES

Lester Earl Coleman, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

No Drawing. Filed Mar. 27, 1970, Ser. No. 23,498
Int. Cl. C07d 1/20
U.S. Cl. 260—348 A 5 Claims

Epoxides are prepared from N-3-oxohydrocarbon-substituted and N-3-hydroxyalkyl acrylamides, especially diacetone acrylamide, by reaction with a hypohalous acid followed by treatment with alkali or by reaction with a carboxylic peracid. These epoxides are useful as diluents for epoxy resins.

3,663,574

PROCESS FOR THE CONTINUOUS PRODUCTION OF PROPYLENE OXIDE

Kazuo Yamagishi, Tokyo, and Osamu Kageyama and Yoshiaki Numa, Ohimachi, Saitama, Japan, assignors to Daicel Ltd., Osaka, Japan

Filed May 12, 1969, Ser. No. 823,605
Claims priority, application Japan, May 11, 1968, 43/31,513
Int. Cl. C07d 1/12
U.S. Cl. 260—348.5 7 Claims

Propylene oxide is produced by incorporating bubbles of propylene gas at a pressure in the range of 3–50 kg./sq. cm. gauge into an organic solvent solution of peracetic acid and forwarding the reactants in concurrent flow through a series of reaction zones separated by perforate members whose perforations have a diameter in the range of 2 to 10 mm. and a perforation ratio of 1 to 20%. The flow rate of the solution is less than 2000 in Reynolds number and the superficial velocity of the propylene bubbles is in the range of 0.05–50 cm./sec. The temperature in the reaction system is in the range of 30° C. to 80° C. and the mean residence time of the reactants in the reaction system is in the range of 30 to 180 minutes.

3,663,575

PROCESS FOR THE PRODUCTION OF AROMATIC LACTONES

Ernst Roos, Cologne-Flittard, and Klaus Wagner, Cologne-Buchheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed July 2, 1968, Ser. No. 741,851
Claims priority, application Germany, Aug. 23, 1967, F 53,311
Int. Cl. C07d 5/34
U.S. Cl. 260—343.3 4 Claims

Production of aromatic lactones by hydrolyzing an aromatic compound, e.g. benzene, naphthalene and diphenyl-dichloro-methane compounds, containing at least two orthdichloromethyl groups, with the remainder of the nuclear positions thereof having all of the corresponding hydrogen atoms thereat substituted by chloro and/or dichloromethyl substituents, with a hydrolyzing agent, e.g. at least about 75% sulfuric acid or oleum at about 80–200° C., such aromatic lactones being usable as intermediates for reaction with primary and secondary amines, i.e. to exchange one or more chloro substituents therewith, to form fluorescent dyes or optical brighteners, those aromatic lactones in which at least one substituent is other than chloro being new.

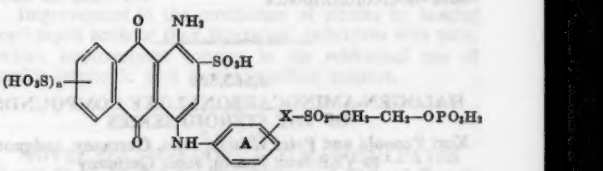
3,663,576

WATER-SOLUBLE ANTHRAQUINONE DYESTUFFS

Fritz Meininger, Frankfurt am Main, Klaus Hunger, Kelkheim, Taunus, and Hartmut Springer, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 6, 1969, Ser. No. 848,073
Claims priority, application Germany, Aug. 10, 1968, P 17 93 172.5
Int. Cl. C09b 1/34
U.S. Cl. 260—372 6 Claims

Water-soluble anthraquinone dyestuff having in form of the free acid formula



in which X represents a direct linkage, —CH_2—, —CH_2CH_2—, —NH— or —N(lower alkyl)—, the benzene nucleus is unsubstituted or substituted by hydrogen, methyl, lower alkoxy, carboxyl, chlorine or bromine, and *n* stands for 0 or 1, the said dyestuffs being suitable for the dyeing or printing of leather or of fibrous materials consisting of wool, silk, linear polyamides, native or regenerated cellulose fibres, the dyeings or prints obtained on said materials being distinguished by very good fastness properties to wetting and to light.

3,663,577

ANTHRAQUINOID DYESTUFFS

Richard Peter, Hans-Joerg Angliker, and Angelo Della Casa, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed July 22, 1969, Ser. No. 843,834
Claims priority, application Switzerland, July 26, 1968, 11,234/68
Int. Cl. C09b 1/32, 1/50
U.S. Cl. 260—377 3 Claims

An anthraquinoid dyestuff which comprises at least one residue of an anthraquinoid disperse dyestuff and at least one residue of a disperse dyestuff of the styryl series.

3,663,578

CATALYTIC OXIDATION OF ALKYL-SUBSTITUTED HYDROQUINONES TO THE CORRESPONDING P-BENZOQUINONES

Nikolaus von Kutepow, Karlsruhe, August Magin, Mutterstadt, and Hans-Ingo Joschek, Mannheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 1, 1970, Ser. No. 24,524
Int. Cl. C07c *49/64*
U.S. Cl. 260—396 R 9 Claims

Air oxidation of alkyl-substituted hydroquinones in the presence of heavy metal salts as catalysts in a liquid mixed phase consisting of an aqueous phase and an organic phase. The aqueous phase contains dissolved catalyst and additives for setting up a pH below 7, and the organic phase is a selective solvent for the alkyl-substituted p-benzoquinone formed in the oxidation. The process enables 2,3,6-trimethylhydroquinone, an important intermediate in the synthesis of vitamin E, to be separated from mixtures of methyl-substituted hydroquinones.

3,663,579

DIMERIC STEROID-21-ALKYL-CARBONATES AND PROCESS FOR THEIR MANUFACTURE

Ulrich Stache and Werner Haede, Hofheim, Taunus, Werner Fritsch, Neuenhain, Taunus, Kurt Radscheit, Kelkheim, Taunus, and Hans-George Schroder, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Apr. 24, 1969, Ser. No. 819,092
Claims priority, application Germany, May 3, 1968, P 17 68 345.3
Int. Cl. C07c *169/32*
U.S. Cl. 260—397.45 10 Claims

Bis[steroid - 21] - alkyl carbonates having anti-inflammatory activity are prepared by reacting corticosteroids with bis-chloroformiates.

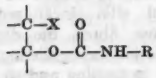
3,663,580

HALOGEN-AMINOCARBONYLOXY COMPOUNDS OF THE STEROID SERIES

Kurt Ponsold and Peter Grosse, Jena, Germany, assignors to VEB Jena Pharm, Jena, Germany

No Drawing. Filed Mar. 6, 1970, Ser. No. 17,325
Int. Cl. C07c *169/20, 169/60*
U.S. Cl. 260—397.2 24 Claims

Vicinal halogen-aminocarbonyloxy compounds of the steroid series, in which the amino group can be substituted or unsubstituted, having the formula



wherein C—C designates a segment of the steroid framework, X designates halogen, and R designates hydrogen, an alkyl, aryl, arylalkyl, cyclohexyl, unsubstituted or substituted amino group or acid group and a process of preparing this class of compounds comprising reacting a cis- or trans-halogen-hydrine of the steroid series with phosgene in an inert solvent under addition of a basic catalyst to form the corresponding chlorocarbonic acid ester, reacting the latter with an NH-active compound in a solvent under addition of an acid binding agent, the reaction being facilitated where necessary by addition of a tertiary amine.

The steroids of the invention are characterized by their outstanding pharmacological activity.

3,663,581

PROCESS FOR THE PROTECTION OF AUTO-OXIDIZABLE MATERIALS

Gunter Lehmann, Saarbrucken, Otto Neunhoeffer, Homburg, Saar, Wilhelm Roselius, Bremen-St. Magnus, and Otto Vitzthum, Bremen, Germany, assignors to Hag Aktiengesellschaft, Bremen, Germany

No Drawing. Filed Feb. 11, 1970, Ser. No. 10,595
Int. Cl. C11b *5/00*
U.S. Cl. 260—398.5 3 Claims

A process for protecting auto-oxidizable materials through the addition of an antioxidative substance in the form of an extract of green coffee beans.

3,663,582

HEXACHLOROCYCLOPENTADIENE ADDUCTS OF UNSATURATED AMIDES

Robert R. Mod, Frank C. Magne, and Eveld L. Skau, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Nov. 21, 1969, Ser. No. 878,922
Int. Cl. C07c *103/19*
U.S. Cl. 260—404 10 Claims

This invention relates to certain new nitrogen-containing compounds, more particularly to N-substituted and N,N-disubstituted amides, the acyl moieties of which are the acyl moieties of the hexachlorocyclopentadiene adducts of either 9-octadeceonic or 10-undecenoic acids.

The compounds which are the subject of this invention are characterized by the fact that as growth inhibitors they are effective against a variety of bacteria, yeasts, and molds, some of which are pathogenic. They are also useful as plasticizers.

3,663,583

PARTIALLY SAPONIFIED ETHOXYLATED TRIGLYCERIDES OF RICINOLEIC ACID

George M. Haynes, Spartanburg, S.C., assignor to Whitestone Chemical Corporation, Spartanburg, S.C.

No Drawing. Filed Mar. 30, 1970, Ser. No. 24,011
Int. Cl. B01d *19/04;* C07c *69/66;* C11d *1/72*
U.S. Cl. 260—410.7 9 Claims

Partially saponified castor oil surfactants are prepared by reacting an ethoxylated castor oil surfactant with about 0.5 to 3.0 moles, per mole of ethoxylated castor oil, of an alkali metal hydroxide. The reaction is carried out at a temperature ranging from about 75° C. to 100° C., for a period of about 0.5 to 3.0 hours. The products of the present invention are improved surfactants exhibiting excellent detergency; low foaming characteristics; stability in both alkaline and acid solutions; complete water solubility and no cloud point in typical aqueous use solutions.

3,663,584

DI-(6-METHOXY-2-NAPHTHYL)ZINC AND 6-METHOXY-2-NAPHTHYLZINC HALIDE

Francisco Alvarez, Sunnyvale, Calif., assignor to Syntex Corporation, Panama, Panama

No Drawing. Filed Dec. 4, 1970, Ser. No. 95,377
Int. Cl. C07f *3/06*
U.S. Cl. 260—429.9 3 Claims

2-(6-methoxy-2-naphthyl)propionic acid is prepared by reacting di(6 - methoxy-2-naphthyl)zinc or 6-methoxy-2-naphthylzinc halide with a lower alkyl 2-halopropionate in a suitable solvent to form a lower alkyl 2-(6-methoxy-2-naphthyl)propionate and hydrolyzing the ester group thereof. The product has anti-inflammatory, analgesic and anti-pyretic activities.

3,663,585

PROCESS FOR LITHIATING FERROCENE

Arthur W. Langer, Jr., Watchung, N.J., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 690,076, Dec. 13, 1967, which is a continuation-in-part of application Ser. No. 560,110, June 24, 1966, which is a continuation-in-part of application Ser. No. 505,976, Nov. 1, 1965, which is a continuation-in-part of application Ser. No. 359,434, Apr. 13, 1964, which in turn is a continuation-in-part of application Ser. No. 266,188, Mar. 19, 1963. This application Aug. 3, 1970, Ser. No. 60,772

Int. Cl. C07f *15/02*

U.S. Cl. 260—439 CY 2 Claims

Ferrocene or a derivative thereof is lithiated by reaction, at temperatures in the range 25°–100° C., in a hydrocarbon solvent, with a hydrocarbon lithium, preferably in conjunction with an N,N,N',N'-tetraalkyl ethylene diamine (I). The products produced in conjunction with (I) tend to have higher degrees of lithiation than those produced in the absence of (I).

3,663,586

CYCLIC THIOUREA DERIVATIVES AND PROCESS FOR THEIR MANUFACTURE

Hans Dietrich Golitz, Cologne-Stammheim, Rudolf Merten, Leverkusen, Walter Noll, Opladen, and Walter Simmler, Odenthal-Globusch, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

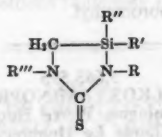
No Drawing. Filed Oct. 16, 1970, Ser. No. 81,513

Claims priority, application Germany, Apr. 13, 1970, P 20 17 507.9

Int. Cl. C07f *27/10*

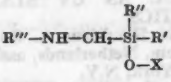
U.S. Cl. 260—448.2 N 13 Claims

Novel cyclic thiourea derivatives containing silicon atoms have the general formula



wherein R is a hydrocarbon radical optionally being interrupted by oxygen atoms in ether linkages, R' and R'' (same or different) are hydrocarbon radicals, halohydrocarbon radicals, cyanohydrocarbon radicals, or alkoxy radicals, and R''' is a hydrocarbon radical. The compounds are useful as cross-linking agents and as intermediates for carbofunctional siloxanes.

These 2,5-diaza-3-silacyclopentathiones can be produced, according to the invention, by reacting an aminomethylalkoxysilane of the general formula



(R', R'' and R''' as above; X=alkyl) at a temperature between 0 and 250° C. with an isothiocyanate of the general formula RNCS (R as above) and recovering the product by distillation under reduced pressure or by filtration.

These products are suitable as intermediates for carbofunctional organopolysiloxanes and as cross-linking agents in water-reactive organopolysiloxane preparations.

3,663,587

BROMINATED SILOXANES AND THEIR PREPARATION

Donald John Holman, Wedhey, Harlow, England, assignor to Berk Limited, London, England

No Drawing. Filed Oct. 4, 1968, Ser. No. 765,006

Claims priority, application Great Britain, Oct. 18, 1967, 47,454/67

Int. Cl. C07f *7/04, 7/06, 7/18*

U.S. Cl. 260—448.8 R 4 Claims

Stable brominated siloxanes having the formula

$$R_x(Br_5C_6O)_{3-x}Si—O—Si(OC_6Br_5)_{3-x}R_x$$

in which R is alkyl and x is 0, 1 or 2, are provided. These compounds are useful as fire retardant additives in polymer compositions.

3,633,588

CERTAIN DIFLUORAMINO COMPOUNDS

Donald Pilipovich, Canoga Park, and Michael G. Warner, Camarillo, Calif., assignors to North American Rockwell Corporation

Continuation-in-part of application Ser. No. 568,097, July 21, 1966. This application Apr. 18, 1967, Ser. No. 634,031

Int. Cl. C07c *35/02;* C07c *87/22*

U.S. Cl. 260—453 R 5 Claims

The invention relates to the compounds $CF_2(ONF_2)_2$ and $CF_2(ONF_2)OF$ and a method for their production. The method comprises reacting $CF_2(ONF_2)$ and

$$MF \cdot HNF_2$$

where M is K, Rb and Cs at temperatures between −126° C. and +27° C.

3,663,589

PROCESS FOR THE PRODUCTION OF NITRILES

Juergen Luecke, Tubingen, Germany, assignor to Sandoz Ltd., Basel, Switzerland

No Drawing. Filed Mar. 17, 1969, Ser. No. 807,914

Int. Cl. C07c *121/10, 121/00, 121/46*

U.S. Cl. 260—464 12 Claims

Improvement in the production of nitriles by heating carboxylic acids or their functional derivatives with urea, which improvement consists in the additional use of amido-sulphonic acid in the reaction mixture.

3,663,590

NOVEL POLYHALOORGANO HALOSULFATES

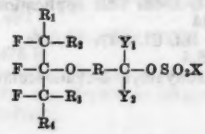
Louis Gene Anello, Basking Ridge, and Richard Francis Sweeney, Dover, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Apr. 23, 1969, Ser. No. 818,826

Int. Cl. C07c *143/68*

U.S. Cl. 260—456 R 27 Claims

Halosulfates of the formula:

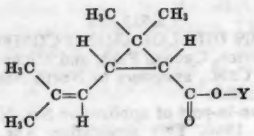


wherein R_1–R_4 are independently selected from the group consisting of F, Cl, alkyl and haloalkyl groups in which the halogen atoms are Cl or F; R_1 and R_4 when taken together and with the carbon chain therebetween form a cyclic structure, R is an alkylene or haloalkylene group in which the halogen atoms are selected from Cl and F, Y_1 is selected from H, F, Cl and perhaloalkyl groups in which the halogen atoms are selected from F and Cl, Y_2 is selected from F and Cl and X is selected from F and Cl; may be prepared by reacting a corresponding polyhaloorgano alkyl iodide with chlorosulfonic or fluorosulfonic acid as appropriate. The novel halosulfate products are

useful as surfactants, oil, stain and water repellent agents and as intermediates to other valuable surface active agents.

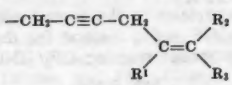
3,663,591
CHRYSANTHEMIC ACID ESTERS
John Mervyn Osbond, Hatfield, and James Charles Wickens, St. Albans, England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Nov. 28, 1969, Ser. No. 880,964
Claims priority, application Great Britain, Dec. 9, 1968, 58,351/68, 58,352/68, 58,353/68, 58,354/68
Int. Cl. C07c *69/74;* A01n *9/24*
U.S. Cl. 260—468 P 19 Claims

The invention comprises chrysanthemic acid ester compounds of the formula

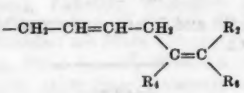


(I)

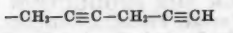
wherein Y is the moiety



(a)

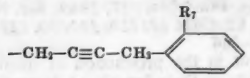


(b)



(c)

or

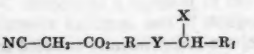


(d)

wherein R^1–R_7 is hydrogen or an alkyl group. The compounds of Formula I are useful as insecticides and are prepared by reacting an acid chloride with alcohol or by reacting a halide with a salt of a chrysanthemum carboxylic acid.

3,663,592
FLUOROALKOXYALKYL 2-CYANOACETATES
Elden H. Banitt, Woodbury Village, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Continuation-in-part of application Ser. No. 734,195, June 4, 1968. This application Dec. 2, 1969, Ser. No. 881,584
Int. Cl. C07c *121/16*
U.S. Cl. 260—465.4 6 Claims

Fluorinated alkoxyalkyl 2-cyanoacetates having the formula



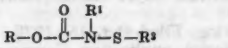
wherein R is a straight or branched, divalent, aliphatic hydrocarbon radical having from 2 to 8 carbon atoms; R_f is a straight or branched fluoroaliphatic radical having from 1 to 5 carbon atoms, Y is O or S and X is H, lower alkyl or lower fluoroaliphatic have been found to be useful intermediates in synthesizing cyanoacrylates which are useful adhesives. When the latter are applied as monomers to adherends, they polymerize rapidly in the presence of even small amounts of, e.g., moisture, to form strong bonds.

3,663,593
FUNGICIDAL COMPOSITION
Hiroshi Takeda, Tokyo, Japan, and Walter H. Schuller and Ray V. Lawrence, Lake City, and Seymour S. Block, Gainesville, Fla., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed July 18, 1969, Ser. No. 843,225
Int. Cl. C07c *63/04, 69/76*
U.S. Cl. 260—469 5 Claims

This invention relates to the formation of a new composition of matter, active as a fungicide. This product is prepared by heating either methyl levopimarate or a salt of levopimaric acid in the presence of a proton acceptor such as potassium hydroxide, sodium hydroxide, tris-n-butylamine, etc. and the resulting mixture ozonized and the ozonide oxidized by the method of King and Farber.

3,663,594
N-SUBSTITUTED ARYL CARBAMATES
Melancthon S. Brown and Gustave K. Kohn, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.
No Drawing. Continuation-in-part of application Ser. No. 764,299, Oct. 1, 1968. This application Sept. 4, 1969, Ser. No. 855,421
Int. Cl. C07c *149/40*
U.S. Cl. 260—470 5 Claims

Insecticidal carbamates of the formula



wherein R is aryl or aralkyl of 6 to 20 carbon atoms, R^1 is H or alkyl of 1 to 6 carbon atoms, and R^2 is alkyl of 1 to 10 carbon atoms or monocyclic aryl of 6 to 12 carbon atoms substituted with 0 to 2 alkyl in which the total number of carbon atoms in the alkyl groups combined is 1 to 6, 0 to 2 halogens of atomic number 17 to 35 or 0 to 2 trifluoromethyl.

3,663,595
CARBALKOXYAMINOPROPANE
Laszlo Beregi, Boulogne, Pierre Hugon, Rueil-Malmaison, and Jean-Claude Le Douarec, Suresnes, France, assignors to Société et nom collectif Science Union et Cie, Societe Francaise de Recherche Medicale, Suresnes, France
No Drawing. Filed Sept. 6, 1968, Ser. No. 762,328
Claims priority, application France, Sept. 22, 1967, 121,906
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C 1 Claim

1-trifluoromethylphenyl-2 - carbalkoxyamino propanes having anorexigenic properties.

3,663,596
ALIPHATIC ESTERS OF 3,5-DI-ALKYL SALICYLIC ACIDS USEFUL AS UV STABILIZERS FOR THERMOPLASTICS
Hans A. Gersmann, Hendricus A. Oosterhof, and Aart Strang, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.
No Drawing. Original application Mar. 1, 1968, Ser. No. 709,811, now Patent No. 3,542,728, dated Nov. 24, 1970. Divided and this application Aug. 10, 1970, Ser. No. 62,672
Int. Cl. C07c *69/76*
U.S. Cl. 260—473 S 5 Claims

Thermoplastic compositions comprise as stabilizers against actinic radiation certain esters of mono- or polyvalent saturated non-aromatic alcohols with certain 2-hydroxybenzoic acids having an alkyl or alkoxy substituent in the ring in the 3-position, the 5-position, or both.

3,663,597
PROCESS FOR THE PURIFICATION OF CYCLANDELATE

David Flitter, Havertown, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed May 5, 1970, Ser. No. 34,894
Int. Cl. C07c *65/02*
U.S. Cl. 260—473 A 7 Claims

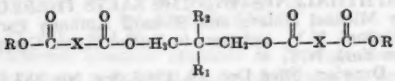
The amount of the impurity trimethylcyclohexylphenylglyoxylate formed in the preparation of cyclandelate by the reaction of 3,3,5-trimethylcyclohexanol and mandelic acid may be substantially reduced or eliminated by stirring crude cyclandelate in solution with an aqueous solution of sodium borohydride at temperatures ranging from 25 to 65° C. and a pH of 2.5 to 11.5. The amount of borohydride ranges from 0.5 to 2.0 percent by weight of the amount of cyclandelate present.

3,663,598
PHTHALATE ESTERS

Joseph A. Vasta, Woodbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 2, 1968, Ser. No. 718,246
Int. Cl. C07c *69/80*
U.S. Cl. 260—475 P 1 Claim

Compound of the formula



where

R is an alkyl group or a cyclohexyl group,
R_1 is hydrogen or an alkyl group,
R_2 is —OH or —CH_2OH, and
X is the residue from phthalic acid, maleic acid, or succinic acid,

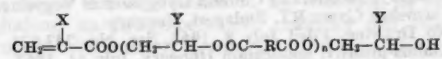
and coating compositions containing these compounds.

3,663,599
METHOD OF PRODUCING VINYLIC POLYMERIZABLE MONOMERS

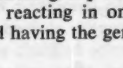
Masamitsu Koshimura, Tokyo, Yukinori Haruta and Junichi Matsuzaka, Yokohama, and Shinichi Wako, Fujisawa, Japan, assignors to Nippon Oils and Fats Company Limited, Tokyo, Japan

No Drawing. Filed May 6, 1969, Ser. No. 822,299
Claims priority, application Japan, May 8, 1968, 43/30,658; Oct. 15, 1968, 43/75,082; Nov. 5, 1968, 43/80,376
Int. Cl. C07c *69/80*
U.S. Cl. 260—475 P 9 Claims

Reactive monomeric polyester containing a vinylic unsaturated bond and a hydroxyl group, which has the following general formula

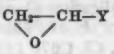


wherein X is hydrogen, methyl or ethyl group, Y is hydrogen, methyl, phenyl or CH_2Z group, in which Z is a halogen or an alkyl group, R represents an aliphatic, alicyclic or aromatic group and *n* is an integer of 1 to 3, is produced by reacting in one step at least one vinylic unsaturated acid having the general formula



with at least one organic dibasic acid anhydride having the general formula

and at least one monoepoxide having the general formula



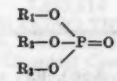
X, Y and R in the above formula having the same meanings as described above, at a temperature lower than 100° C. by using lithium salt alone or in admixture with quaternary ammonium salt as a catalyst.

3,663,600
PURIFICATION OF BIS(β-HYDROXYETHYL) TEREPHTHALATE

Wayne V. McConnell, James H. Bond, and Nicholas C. Russin, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 15, 1969, Ser. No. 885,287
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 PR 6 Claims

A process for the purification of bis(β-hydroxyethyl) terephthalate, and particularly that prepared by the esterification of terephthalic acid with ethylene glycol, which comprises dissolving one part of crude bis(β-hydroxyethyl) terephthalate in a hot solvent, treating the solution with from about 0.005 to about 0.5 part, based on the bis(β-hydroxyethyl) terephthalate, of a phosphorus containing component selected from phosphoric acid, phosphorous acid, and phosphate esters having the general formula



wherein each of R_1, R_2 and R_3 are selected from hydrogen or straight or branched chain alkyl radicals having from 1 to 10 carbon atoms, and wherein the ester contains at least an average of 0.5 acidic hydrogen atoms for each phosphorus atom, filtering the hot solution and cooling the filtrate to cause pure bis(β-hydroxyethyl) terephthalate to crystallize therefrom.

3,663,601
ALLYL-BETA-PHENYLPROPIONATE

Morris Dunkel, Paramus, N.J., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 483,310, Aug. 27, 1965. This application Mar. 26, 1969, Ser. No. 811,691
Int. Cl. C07c *69/76*
U.S. Cl. 260—476 R 4 Claims

Allyl-beta-phenylpropionate as new compositions of matter and to the use thereof as olfactory ingredients in perfume compositions.

3,663,602
1,1-DIARYL-2-ADAMANTYL ETHYLENE COMPOUNDS

Martin Steinman, Bloomfield, N.J., assignor to Schering Corporation, Bloomfield, N.J.

No Drawing. Filed Aug. 25, 1969, Ser. No. 852,906
Int. Cl. C07c *69/76*
U.S. Cl. 260—479 R 6 Claims

1,1-diaryl-2-adamantyl ethylene compounds particularly useful as antifertility agents.

3,663,603

HYDRAZINE-CARBOXYLIC ACID ESTERS AND PROCESS FOR THE PRODUCTION THEREOF

Erwin Müller and Wolfgang Heydkamp, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 12, 1968, Ser. No. 712,355
Claims priority, application Germany, Mar. 25, 1967, F 51,948
Int. Cl. C07c *133/00*
U.S. Cl. 260—482 B 7 Claims

Polyhydrazine-monocarboxylic acid esters and a process for their production by reacting a polymonophenyl carbonate of a polyhydric alcohol with hydrazine or hydrazine hydrate.

3,663,604

POLYFLUOROCARBAMATES

Walter Blöchl, Karlsruhe, Germany, assignor to FMC Corporation, New York, N.Y.

No Drawing. Filed Mar. 5, 1969, Ser. No. 804,699
Int. Cl. C07c *125/04*
U.S. Cl. 260—482 C 9 Claims

Hydroxymethylated derivatives of fluorinated carbamates are useful to impart oil and water repellency to fibrous substrates. The carbamates have the formula:

$$R_f—Y—OCONH_2$$

where R_f is a perfluoroalkyl group of 4–16 carbon atoms and Y is an alkylene bridge optionally interrupted with —O—, —S—, —SO—, —SO_2— and —NR— wherein R is lower alkyl or lower hydroxyalkyl. Examples are given where Y contains 3 to 5 carbon atoms.

3,663,605

N-PHENETHYLACETAMIDES AND RELATED COMPOUNDS

Ronald J. McCaully, Malvern, and George L. Conklin, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 831,726, June 9, 1969. This application May 15, 1970, Ser. No. 37,908
Int. Cl. C07c *69/16, 69/28, 67/00*
U.S. Cl. 260—490 30 Claims

Novel compounds are prepared by condensing a substituted phenylamine or a phen(lower)alkylamine with a reactive di(lower)alkanoyloxyacetyl compound such as the chloride. The novel compounds are pharmacologically active as central nervous system depressant agents and are of value in the calming of mammals.

3,663,606

ORGANIC IMINO-COMPOUNDS

Yoshikazu Isowa, Tokyo, Japan, assignor to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed June 16, 1967, Ser. No. 646,536
Int. Cl. C07c *101/20*
U.S. Cl. 260—471 A 2 Claims

Novel organic imino-compounds produced by decomposition with water or an alcohol of organic imino-compound metal chloride coordination complexes obtained by the reaction of an aliphatic or aromatic nitrile, e.g., acetonitrile or benzonitrile, and an active methylene compound, e.g., diethyl malonate, in the presence of a metal chloride, e.g., stannic chloride. Processes for producing such organic imino-compounds.

3,663,607

1-CARBAMOYLALKYL PHENOXY-3-AMINO-2-PROPANOLS

Arthur Michael Barrett, John Carter, Roy Hull, David James Le Count, and Christopher John Squire, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Feb. 6, 1970, Ser. No. 9,451
Claims priority, application Great Britain, Feb. 21, 1969, 9,445/69
Int. Cl. C07c *103/28*
U.S. Cl. 260—501.1 9 Claims

Novel 1-(electronegatively-substituted-alkyl- or alkenylphenoxy)-3-alkylamino-2-propanol derivatives, for example 1-p-carbamoylmethylphenoxy-3-isopropylamino-2-propanol, methods for their preparation and pharmaceutical compositions containing them. The compounds possess β-adrenergic blocking activity and are useful in the treatment of heart diseases and other complaints in man.

This invention relates to new alkanolamine derivatives which possess β-adrenergic blocking activity and which are therefore useful in the treatment or prophylaxis of heart diseases, for example angina pectoris and cardiac arrhythmias, and in the treatment of hypertension and phaeochromocytoma, in man.

3,663,608

1-PHENYL-3-AMINOALKYL-1,2,3,4-TETRAHYDRONAPHTHALENES AND THE SALTS THEREOF

Henry Michael Holava and Richard Anthony Partyka, Liverpool, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed Dec. 10, 1969, Ser. No. 883,985
Int. Cl. C07c *87/28*
U.S. Cl. 260—501.1 5 Claims

The specification discloses the preparation of certain 1-phenyl-3-aminoalkyl-1,2,3,4-tetrahydronaphthalenes which have been found to have activity as either anorectic agents or central nervous system stimulants and the corresponding 3-carbamoyl-1,2,3,4-tetrahydronaphthalenes which are used as intermediates in the disclosed synthesis.

3,663,609

METHOD OF PRODUCING ALKYL ALKOXYBENZENE DISULFONATES

Gar Lok Woo, Tiburon, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Oct. 16, 1970, Ser. No. 81,508
Int. Cl. C07c *143/42*
U.S. Cl. 260—512 R 13 Claims

Method of producing alkyl alkoxybenzene disulfonates comprising reacting a 2- to 4-carbon olefin with an alkylphenol disulfonate under superatmospheric pressure followed by neutralization and digestion of the mixture.

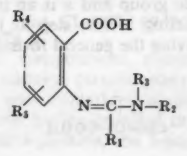
3,663,610

AMIDINE DERIVATIVES WITH SPASMOLYTIC, PSYCHOSTIMULANT AND ANOREXIGENIC PROPERTIES

Zoltán Ecsery, Ildikó Kósa, and József Knoll, Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT, Budapest, Hungary

No Drawing. Filed July 8, 1968, Ser. No. 743,031
Claims priority, application Hungary, July 11, 1967, CI–718
Int. Cl. C07c *101/54*
U.S. Cl. 260—518 R 2 Claims

Psychostimulant, anorexigenic and spasmolytic compounds of the general formula



wherein

R_1 is a member selected from the group consisting of hydrogen, alkyl, substituted alkyl, aryl, substituted aryl and heterocyclic radical,

R_2 is a member selected from the group consisting of hydrogen, alkyl, substituted alkyl, aryl, substituted aryl and heterocyclic radical,

R_3 is a member selected from the group consisting of hydrogen, alkyl, substituted alkyl, aryl, substituted aryl and heterocyclic radical,

R_4 is a member selected from the group consisting of hydrogen, halogen, nitro, amino, acylamino, hydroxy and alkoxy,

R_5 is a member selected from the group consisting of hydrogen, halogen, nitro, amino, acylamino, hydroxy and alkoxy.

3,663,611

PROCESS FOR CONDUCTING EXOTHERMIC CHEMICAL REACTION IN HETEROGENEOUS GAS-LIQUID MIXTURES

Germany, assignors to Dynamit Nobel AG, Troisdorf, Hans Leuck, Troisdorf, and Erich Kratz, Porz-Zundorf, Germany

Filed Aug. 29, 1969, Ser. No. 854,223
Claims priority, application Germany, Aug. 29, 1968, P 17 92 402.6
Int. Cl. C07c *63/02*
U.S. Cl. 260—524 R **9 Claims**

Exothermic chemical reactions in heterogeneous gas-liquid mixtures are carried out by conducting the reaction in a reaction column containing a cooling means and which is in communication with a corresponding parallel-arranged reflux column of the same length, the gaseous reactant being introduced into the reaction column at a unit charge of 0.3 to 0.6 $Nm.^3$ of gas per square meter of reactor cross-section per second and wherein about 60–80% of the gas is introduced into the reaction column and the remainder into the reflux column. The process is especially advantageous for oxidizing a mixture of p-xylene and methyl p-toluate during the production of dimethyl terephthalate.

3,663,612

METHOD OF SEPARATING LEVULINIC ACID AS AN ALKALINE-EARTH LEVULINATE FROM HEXOSE-CONTAINING CARBOHYDRATE SUBSTRATES

Emiliano Ramos-Rodriguez, San Juan, Puerto Rico, assignor to the Government of the Commonwealth of Puerto Rico

Filed Aug. 8, 1969, Ser. No. 848,462
Int. Cl. C07c *51/42*
U.S. Cl. 260—527 R **17 Claims**

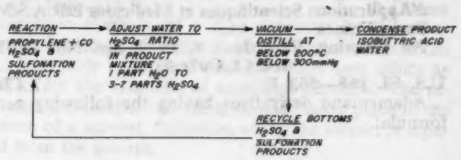
A method of clarification is provided for separating levulinic acid as alkaline earth levulinate directly from the liquor that is produced in the treatment of sugar solutions, starch, lignocellulosic materials and related products with catalysts of mineral or organic acids in the presence of heat and pressure. The method includes treatment of the liquor with an alkaline agent such as alkaline earth hydroxide to neutralize the liquor, raise the pH, separate impurities and produce alkaline earth levulinate and further treatment of the liquor with oxidant, phosphoric acid and additional alkaline agent to bleach, decompose and separate impurities and destroy foaming compounds. The clarified solution produced by this process contains alkaline earth levulinate which easily yields said alkaline earth levulinate on evaporation and crystallization.

3,663,613

SEPARATION OF ORGANIC ACID PRODUCTS AND WATER FROM CATALYSTS AFTER SYNTHESIS BY REDUCED PRESSURE DISTILLATION

Venkatrao Krishnaraya Pai, Stamford, and Daniel Hyman, Greenwich, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 18, 1969, Ser. No. 800,289
Int. Cl. B01d *3/10*; C07c *51/14*
U.S. Cl. 260—533 A **7 Claims**



Vacuum distillation of a product mixture comprising isobutyric acid, water, sulfuric acid, and hydroxyalkanesulfonic acid with its sulfuric acid ester, surprisingly results in practically complete separation of isobutyric acid and some water leaving practically all of the other acids in the residue. Concentration of water in the residue is also reduced to desired level by vacuum distillation without expected decomposition of the olefin sulfonation products. The distillation residue is a suitable catalyst for recycle to a high pressure carbonylation reaction that produces the product mixture to be distilled. Thus the invention provides easy separation of carboxylic acid product from the catalyst which can be continuously recycled.

3,663,614

METHOD OF MAKING TRIMETHYLUREA

Kenneth C. Rennells, Whitehall, Mich., assignor to The Ott Chemical Company

No Drawing. Filed Feb. 19, 1969, Ser. No. 800,756
Int. Cl. C07c *127/18*
U.S. Cl. 260—553 R **6 Claims**

Covers a method of making trimethylurea by heating a tetramethylurea salt at a sufficient temperature to cleave said salt, thereby forming said trimethylurea, which is recovered.

3,663,615

NUCLEAR SULFAMOYL N-ORGANOSULFONYL BENZAMIDES

Carl Ziegler, Glenside, and James M. Sprague, Gwynedd Valley, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,915
Int. Cl. C07c
U.S. Cl. 260—556 AC **6 Claims**

Nuclear sulfamoyl and nuclear sulfonyl substituted N-organosulfonyl benzamides and salts thereof wherein the benzene ring may be either unsubstituted or substituted by one or more lower alkyl, halo, trihalomethyl, nitro, carboxy, amino, halosulfonyl, alkylsulfonyl or sulfamoyl radicals. The products are prepared by treating a nuclear sulfamoyl- (or sulfonyl)substituted benzoyl halide with an organosulfonamide or salt thereof. The products are useful as uricosuric agents in the treatment of gout and gouty arthritis.

3,663,616

BIS(2-CARBAMYLPHENYL)DISULFIDES

John C. Grivas, South Holland, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

No Drawing. Filed Oct. 13, 1969, Ser. No. 865,977
Int. Cl. C07c *103/26*
U.S. Cl. 260—558 S **5 Claims**

Novel bis(2-carbamylphenyl)disulfides are effective in controlling mildew fungi, especially *Pullularia pullulans*

and can be incorporated in organic coating compositions. About 0.5–1% concentration in paint provides protection against mildew.

3,663,617

1-(ADAMANTYLMETHYLOXY) - 2 - HYDROXY-3-SUBSTITUTED AMINO PROPANES AND ACID ADDITION SALTS THEREOF

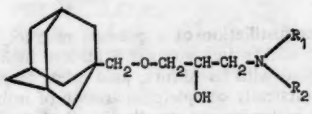
Andrea Pedrazzoli, Milan, and Leone Dall'Asta, Pavia, Italy, assignors to Societe d'Etudes de Recherches et d'Applications Scientifiques et Medicales E.R.A.S.M.E., Paris, France

No Drawing. Filed June 4, 1970, Ser. No. 43,582

Int. Cl. C07c *93/12*

U.S. Cl. 260—563 P **7 Claims**

Adamantane derivatives having the following general formula:



and their pharmaceutically acceptable acid addition salts are useful as sympaticolytic, myolitic, analgesic and, particularly, as local anaesthetic and β-adrenergic blocking agents. The novel compounds are prepared starting from 1 - hydroxy - methyl - adamantane through the new intermediate 1-(adamantyl-methyloxy) - 2,3 - epoxypropane.

3,663,618

FLUORINATED CYCLOHEXYLAMINE DERIVATIVES AND COMPOSITIONS EMBODYING THE SAME

Maurice S. Baseman, 5890 Hobart St., Pittsburgh, Pa. 15217

No Drawing. Original application July 18, 1967, Ser. No. 654,090, now Patent No. 3,558,513, dated Jan. 26, 1971. Divided and this application Sept. 8, 1970, Ser. No. 70,595

Int. Cl. C23f *11/00*

U.S. Cl. 260—563 R **3 Claims**

The reaction product of hexafluoroisopropanol with monocyclohexylamine or dicyclohexylamine, or mixtures of both, have been produced. These reaction products have been found to be unusually effective as corrosion inhibitors. The reaction products can be used alone or carried in or on the surface of paper, plastics or other solid materials; they can be added to hydrocarbons, oils, greases, hydraulic fluids and other liquid carriers, either in solution or in suspension, and they prevent rusting of ferrous metals or corrosion of other metals.

3,663,619

PROCESS FOR THE PREPARATION OF 2,2',6,6'-TETRABROMO-4,4'-METHYLENEDIANILINE

Robert M. Thomas and Rastko I. Mamuzic, West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

No Drawing. Filed July 22, 1969, Ser. No. 843,755

Int. Cl. C07c *85/08*

U.S. Cl. 260—570 D **3 Claims**

2,2',6,6'-tetrabromo - 4,4' - methylenedianiline is produced in high yield by addition of liquid bromine to a methanolic solution of 4,4'-methylenedianiline. Refluxing produces a high yield of methyl bromide as by-product. Washing the separated product with methanol produces a high purity product in high yield.

3,663,620

N-(HALOGENATED BIPHENYL)-DIETHYLENE TRIAMINES

John J. Merianos, Jersey City, Edward Griffin Shay, Belle Mead, Phillip Adams, Murray Hill, and Alfonso N. Petrocci, Glen Rock, N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

No Drawing. Filed Dec. 9, 1969, Ser. No. 883,636

Int. Cl. C07c *91/16*

U.S. Cl. 260—570.5 P **1 Claim**

Microbiocidal ammonia and amino substituted halogenated biphenyls, as well as the nitrogen derivatives thereof such as quaternary ammonium compounds, amine oxides, imidazolines, amides, enamines, ampholytes, and the like.

The ammonia and amino halobiphenyls are prepared by reacting the ammonia or the amine and the halobiphenyl reactants in such a manner that the ratio of amine to halobiphenyl is preferably limited to between two and five mols of amine to each mol of halobiphenyl.

3,663,621

FLUORINATION PROCESS FOR PREPARING CERTAIN DIFLUORAMINO COMPOUNDS

Donald L. Esmay, Coon Rapids, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 531,654, Feb. 21, 1966. This application Sept. 11, 1967, Ser. No. 668,741

Int. Cl. C07c *87/22*

U.S. Cl. 260—583 NH **7 Claims**

Fluorination process especially adapted for the production of highly fluorinated oxidant compounds comprising the steps of forming an adduct between ammonia and a substituted fluorimino compound in solution in an alkyl nitrile, at relatively low temperatures, then adding to this reaction mixture an inert fluorocarbon solvent, followed by direct fluorination by contacting the adduct-solvent mixture with fluorine at a temperature less than 0° C. The process produces improved yields in larger scale reactions.

3,663,622

TRANS-ANNULAR SEC-PHOSPHINE

John L. Van Winkle, San Lorenzo, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Original application Feb. 28, 1968, Ser. No. 708,788, now Patent No. 3,590,087, dated June 29, 1971. Divided and this application Oct. 7, 1970, Ser. No. 86,393

Int. Cl. C07f *9/02*

U.S. Cl. 260—606.5 P **2 Claims**

The novel trans-annular sec-phosphine, hydrocarbyl-(octahydropentalyl-1-)phosphine is used in the selective direct, single-stage production of reaction products consisting predominantly of primary alcohols by reacting an olefinic compound with carbon monoxide and hydrogen at a temperature between about 100° and 300° C. and superatmospheric pressure in the presence of a catalyst of cobalt in complex combination with carbon monoxide and hydrocarbyl(octahydropentalyl-1-)phosphine.

3,663,623

PREPARATION OF IODOMETHYLSULFONES

Aldo J. Crovetti, Lake Forest, and Martin Winn, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed July 25, 1969, Ser. No. 845,071

Int. Cl. C07c *147/02*

U.S. Cl. 260—607 A **4 Claims**

A general preparation of iodomethylsulfones in which iodine monochloride is reacted with a substituted sulfonyl

acetic acid in a reaction mixture maintained at a nearly neutral pH to produce a superior conversion.

3,663,624

PREPARATION OF ANHYDROUS ALKALI MERCAPTIDES

Howard E. Jones, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 27, 1969, Ser. No. 869,900
Int. Cl. C07c *149/06*
U.S. Cl. 260—609 R 13 Claims

Anhydrous alkali mercaptides such as potassium methylmercaptide are prepared by reacting the corresponding mercaptan such as methylmercaptan with an aqueous solution of the alkali hydroxide such as potassium hydroxide, in an inert organic medium such as toluene followed by azeotropically distilling off the water while adding additional mercaptan to the reaction mass. The alkali mercaptide can be removed from the resulting anhydrous slurry by filtration or centrifugation or by dissolving the alkali mercaptide in a lower alkanol solvent immiscible with the inert organic medium, and separating the two immiscible phases.

3,663,625

BIS[1-ALKYL(OR ARYL)VINYL]p-PHENYLENE OXIDE MONOMERS

Roy G. Neville, San Carlos, Calif., assignor to Bechtel International Corporation

No Drawing. Filed Apr. 23, 1970, Ser. No. 31,358
Int. Cl. C07c *43/22*
U.S. Cl. 260—612 R 1 Claim

This invention relates to a group of polyindanyl polymers derived from disubstituted phenylene oxides. When suitably catalyzed, the monomers of the invention are polymerized to materials that exhibit improved thermal stability, chemical resistance and mechanical flexibility. These polymeric products can be employed as adhesives, coating materials, and laminating resins; and, when suitably reinforced, they can be used as structural plastics.

3,663,626

HYDROGENATION OF ARYLALDEHYDES

Joseph T. Arrigo, Mount Prospect, and Nils J. Christensen, Palatine, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed May 1, 1969, Ser. No. 821,092
Int. Cl. C07c *29/14*
U.S. Cl. 260—613 D 5 Claims

A continuous process for the hydrogenation of arylaldehydes to the corresponding alcohols effected in contact with a catalyst composite of platinum and alkali metal component.

3,663,627

1-INDANMETHANOLS

Peter Frederick Juby and Thomas William Hudyma, DeWitt, and Richard Anthony Partyka, Liverpool, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed June 1, 1970, Ser. No. 42,457
Int. Cl. C07c *35/22*
U.S. Cl. 260—618 F 8 Claims

5 - cyclohexyl-1-indanmethanols are useful anti-inflammatory agents in the treatment of inflammatory diseases in animals, including man. An example of a compound of the disclosure is 5-cyclohexyl-1-indanmethanol.

3,663,628

CATALYSTS FOR PRODUCING ACETYLENIC ALCOHOLS

Robert J. Tedeschi, Whitehouse Station, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

No Drawing. Continuation of application Ser. No. 845,623, July 3, 1969, which is a continuation of application Ser. No. 661,171, Aug. 14, 1967, which in turn is a continuation of application Ser. No. 352,955, Mar. 18, 1964. This application July 6, 1970, Ser. No. 56,130
Int. Cl. C07c *33/04, 35/08, 33/06*
U.S. Cl. 260—632 Y 9 Claims

Acetylenic alcohols, of a type produced by the reaction of a ketone and acetylene, are reacted with an alkali metal hydroxide to produce adducts which have utility as catalysts for the synthesis of acetylenic alcohols. The reaction of the alcohol and the hydroxide takes place in the presence of a solvent, following which the adduct is separated from the solvent.

3,663,629

PROCESS FOR THE PREPARATION OF 1,1-DIHYDROPERFLUOROALKANOLS

Hartmut Fischer, Kelkheim, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 13, 1970, Ser. No. 63,617
Claims priority, application Germany, Sept. 2, 1969, P 19 44 381.3
Int. Cl. C07c *31/34*
U.S. Cl. 260—633 9 Claims

The hydrogenation of perfluoroalkane carboxylic acids and the lower alkanol esters thereof at elevated temperatures and pressures with a ruthenium catalyst in an aqueous system yields pure 1,1-dihydro-perfluoro alkanols in high yields. The products are useful intermediates, e.g. for the synthesis of water- and oil repellent agents.

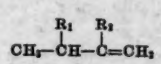
3,663,630

OXIDATIVE DEHYDROGENATION OF 1-BUTENES

Roger M. Bean, Glen Mills, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Sept. 17, 1970, Ser. No. 73,214
Int. Cl. C07c *5/18, 11/12*
U.S. Cl. 260—680 E 7 Claims

Process for oxydehydrogenation of a 1-butene of structure



where R_1 is hydrogen or lower alkyl and R_2 is lower alkyl to form the corresponding 1,4-diolefin by contacting said 1-butene with oxygen at elevated temperature and in the presence of a sodium or calcium type A molecular sieve catalyst.

3,663,631

METHOD OF RECOVERING UNREACTED MONOMERS

Kenji Takeya and Mitsutoshi Okazaki, Okayama, and Toshiyuki Kobashi, Tsukubo-gun, Japan, assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 24, 1970, Ser. No. 31,482
Int. Cl. C07c *121/32, 21/08, 21/06*
U.S. Cl. 260—654 S 10 Claims

A process for recovering unreacted monomers from a polymerization reaction mixture comprising acrylonitrile and a water-insoluble monomer of lower boiling point than acrylonitrile is disclosed which process comprises distilling said monomers from the reaction mixture under vacuum, recovering acrylonitrile and a portion of said

water-insoluble monomer in a first condensation step under vacuum, recovering additional water-insoluble monomer by a second condensation at normal pressure in water at a ratio of monomer to water too low for stratification and and decantation, distilling low-boiling monomer from said second condensate, and recovering said low-boiling monomer as a third condensate at a ratio of monomer to water suitable for stratification and decantation.

3,663,632
METHOD OF RECOVERING UNREACTED MONOMERS

Kenji Takeya and Mitsutoshi Okazaki, Okayama, and Toshiyuki Kobashi, Tsukubo-gun, Japan, assignors to American Cyanamid Company, Stamford, Conn.

Filed May 13, 1970, Ser. No. 36,956
Int. Cl. C07c *21/08, 121/32;* C07k *21/06*
U.S. Cl. 260—654 S **8 Claims**

A process for recovering unreacted monomers from a polymerization reaction mixture comprising acrylonitrile and a water-immiscible monomer of lower boiling point than acrylonitrile is disclosed which process comprises distilling said monomers from the reaction mixture under vacuum, recovering acrylonitrile and a portion of said water-immiscible monomer in a first condensation step, condensing additional monomer while simultaneously introducing into said vapors an organic liquid at a temperature above its melting point, said organic liquid having a melting point below the temperature of condensation and dissolving water at the temperature of condensation, so as to form a second condensate comprising water-immiscible monomer, water and said organic liquid, and recovering low boiling monomer from said second condensate.

3,663,633
ALLENE CHLORINATION

Chester E. Pawloski, Bay City, and Russell L. Stewart, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 22, 1968, Ser. No. 723,243
Int. Cl. C07c *21/04*
U.S. Cl. 260—654 H **8 Claims**

Propargyl chloride and 2,3-dichloropropene are the principal products in a process comprising reacting by contacting allene with chlorine in the presence of water, pref erably at a temperature between 0 and 105° C. Both products are biologically active.

3,663,634
PREPARATION OF ORGANODILITHIUM INITIATOR AND POLYMERIZATIONS UTILIZING SAME

Maurice Morton and Lewis J. Fetters, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Sept. 19, 1969, Ser. No. 859,576
Int. Cl. C07c *11/26*
U.S. Cl. 260—665 R **5 Claims**

A method of preparing hydrocarbon soluble organodilithium polymerization initiators in a one-step process by forming the organodilithium initiators in a solvent system comprising (A) a compound selected from a group consisting of aliphatic, cycloaliphatic and aromatic hydrocarbons and (B) at least one compound selected from a group consisting of aromatic ethers, aromatic thioethers and tertiary amines responding to the formula R′R″R‴N where N is nitrogen and R′, R″ and R‴ are alkyl, cycloalkyl and alkaryl radicals and where R′, R″ and R‴ may or may not be the same and where the (B) solvent component can range from at least 10 percent by volume.

3,663,635
HYDROGENATION PROCESS AND CATALYSTS THEREFOR

Christian Lassau, 11 Rue Lalo, 75 Paris (XVI eme), France; Robert Stern, 20 Bis rue Saint Cyr, 78 Marly-le-Roi, France; and Lucien Sajus, 41 Avenue de Verdun, 78 Croissy-sur-Seine, France

No Drawing. Filed Sept. 5, 1969, Ser. No. 856,251
Claims priority, application France, Sept. 5, 1968, 165,254; Dec. 24, 1968, 180,253; Feb. 17, 1969, 6903966
Int. Cl. C07c *15/00*
U.S. Cl. 260—666 P **2 Claims**

In the hydrogenation of unsaturated compounds such as olefins, there is provided a new improved catalyst. This catalyst is made by contacting a transition metal compound with an aluminum hydride of the formula:

$$AlH_nX_{3-n} \text{ or } Me(AlH_mX'_{4-m})_p$$

wherein

n is 1 or 2,
m is 1, 2 or 3,
Me is a metal of Group I*a* or II*a* of the Periodic Table,
p is the valence of the metal Me,
X is OR, NR_2, NHR or SR,
X′ is R, OR, NR_2, NHR or SR,
R, taken separately, is a monovalent hydrocarbon, and when taken in pairs represent —A—Z—B— wherein A and B each is alkylene, and Z is alkylene, an oxygen or sulfur atom, a NH or N-hydrocarbyl group or a polyvalent metal.

3,663,636
DISPROPORTIONATION AND ISOMERIZATION OF ALKYLAROMATIC HYDROCARBONS

Robert M. Suggitt, Wappingers Falls, Stanley Kravitz, Wiccopee, and John H. Estes, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Nov. 2, 1970, Ser. No. 85,881
Int. Cl. C07c *3/62, 5/24*
U.S. Cl. 260—668 A **15 Claims**

Alkylaromatic hydrocarbons are disproportionated and isomerized in the presence of a catalyst composed of a member of Group VI–B of the Periodic Chart, alumina and fluorine where the catalyst is prepared by contacting a composite of alumina having associated therewith a member of Group VI–B with a combination of (1) hydrogen or carbon monoxide and (2) sulfur hexafluoride, sulfuryl fluoride or thionyl fluoride at a temperature of from about 200 to 1200° F.

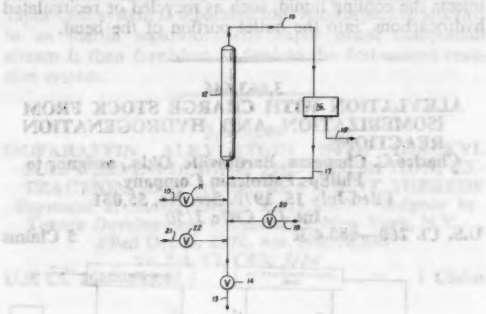
3,663,637
START-UP METHOD FOR HYDROGENATION PROCESS

William G. Juhl, Seabrook, and Jacques D. Robinson and John G. Trafton III, Alvin, Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 23, 1970, Ser. No. 31,176
Int. Cl. C07c *7/00*
U.S. Cl. 260—674 N **8 Claims**

A method for initiating a process wherein a naphthalene concentrate feed containing, as impurities, significant quantities of indenes, monoolefins and diolefins is selectively hydrogenated using a solid hydrogenation catalyst comprised of palladium or platinum on alumina comprising first contacting the catalyst with an inert liquid containing a major proportion of hydrocarbons, said inert liquid being one which does not hydrogenate under the process condtions, slowly admitting hydrogen, maintaining the inert liquid and hydrogen in contact with the catalyst until equilibrium amounts of hydrogen have accumulated on the catalyst and then introducing the naphthalene concentrate feed. The start-up procedure avoids the rapid

temperature rises generally associated with the initiation of the hydrogenation process and substantially prevents



hydrogenation of aromatic rings in the naphthalene concentrate feed.

3,663,638
AROMATIC HYDROCARBON SEPARATION BY ADSORPTION
Richard W. Neuzil, Downers Grove, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Continuation-in-part of application Ser. No. 823,933, May 12, 1969, which is a continuation-in-part of application Ser. No. 739,176, June 24, 1968. This application Aug. 31, 1970, Ser. No. 68,568
Int. Cl. C07c *7/12*; C10g *25/04*
U.S. Cl. 260—674 SA **18 Claims**

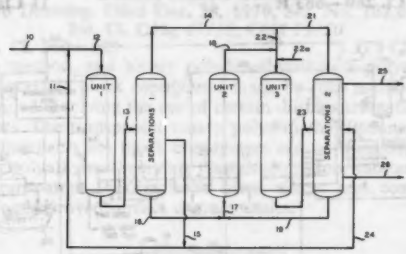
A process for the separation of a C_8 aromatic component from a feed mixture containing at least two C_8 aromatic hydrocarbons using a crystalline aluminosilicate adsorbent containing barium and potassium cations. A feed mixture is contacted with an adsorbent wherein one component of the feed is preferentially adsorbed by the adsorbent. The preferentially adsorbed component of the feed is thereafter recovered utilizing a desorption step.

3,663,639
OPEN-CHAIN OLIGOMERS AND PRODUCTION OF THE SAME
Hiroyuki Morikawa, Ami-machi, and Junji Furukawa, Kyoto-shi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan
Filed Mar. 31, 1970, Ser. No. 24,214
Claims priority, application Japan, Apr. 5, 1969, 44/26,504
Int. Cl. C07c *11/12, 11/100*
U.S. Cl. 260—677 R **14 Claims**

Open-chain co-trimers of 1,3-butadiene with 1,3-pentadiene are produced by the catalytic co-oligomerization of the dienes in which the catalyst is a mixture of (I) a phosphorus compound of the formula $PO(OR)_3$ or $P(OR)_3$, (II) a tetravalent halo-, alkoxy or alkoxyhalo-titanium compound of the formula $Ti(OR')_nX_{4-n}$, and (III) alkyl- or alkylhalo-aluminium compound of the formula AlR''_1Y_m.

3,663,640
CONVERSION OF OLEFINIC HYDROCARBONS
Robert L. Banks, Bartlesville, Okla., assignor to Phillips Petroleum Company
Continuation of application Ser. No. 627,724, Apr. 3, 1967. This application Sept. 17, 1969, Ser. No. 858,736
Int. Cl. C07c *3/62, 11/18*
U.S. Cl. 260—680 R **6 Claims**

A mixture of isobutene and an olefinic hydrocarbon containing four carbon atoms per molecule and having a double bond in the 1-position is contacted with a catalyst, active for disproportionating propylene into ethylene and butene, to produce ethylene and branched olefinic hydrocarbons having six carbon atoms per molecule which are isomerized to produce an approximately equilibrium mixture of isomers. The mixture of isomers is contacted with a catalyst, active for disproportionating propylene into



ethylene and butene, to produce an olefinic hydrocarbon having 5 carbon atoms per molecule. When the olefin having the double bond in the 1-position is 1-butene the 5-carbon olefin is 3-methylbutene-1 and when the olefin having the double bond in the 1-position is 1,3-butadiene the 5-carbon olefin is isoprene.

3,663,641
REMOVAL OF OXYGENATED COMPOUNDS FROM UNSATURATED HYDROCARBONS
Donald O. Hanson, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Sept. 18, 1970, Ser. No. 73,583
Int. Cl. C07c *7/00*
U.S. Cl. 260—681.5 **3 Claims**

Oxygenated materials are removed from unsaturated hydrocarbons; for example, carbonyls are removed from a butadiene stream containing them by a liquid-liquid phase water wash at a temperature below of the order of about 32° F. Freezing point depressants, such as alcohol, glycol, etc., can be added to avoid ice formation.

3,663,642
SYNTHESIS OF ISOPRENE
Rudolph Rosenthal, Broomall, Giovanni A. Bonetti, Wynnewood, and Harold Shalit, Drexel Hill, Pa., assignors to Atlantic Richfield Company, New York, N.Y.
No Drawing. Filed Dec. 16, 1970, Ser. No. 98,894
Int. Cl. C07c *1/20*
U.S. Cl. 260—681 **3 Claims**

Improvement in the method for the synthesis of isoprene by condensation of isobutylene and formaldehyde over an acidic catalyst in the vapor phase, such improvement being increasing the reaction temperature during the duration of the run to compensate for the decrease in activity of the catalyst, thus increasing the length of time between catalyst regenerations without loss in isoprene production rate.

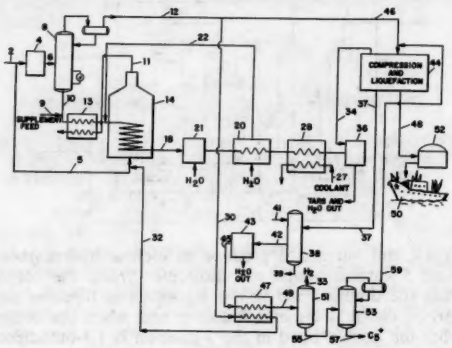
3,663,643
RECOVERY OF BASIC ORGANIC MATERIALS FROM THEIR HYDROLYSIS PRODUCTS
David W. Hall, Vancouver, British Columbia, Canada, assignor to Marathon Oil Company, Findlay, Ohio
No Drawing. Filed Apr. 29, 1968, Ser. No. 725,207
Int. Cl. C07c *1/20*
U.S. Cl. 260—681 **13 Claims**

A process of recovering lactam type organic materials which have undergone hydrolysis by heating the hydrolysis products to a temperature in the range of from 50° C. to 450° C. and at a pressure of from 10 microns to 10 atmospheres while maintaining the hydrolysis products in their free base or acid addition salt form.

3,663,644
INTEGRATED ETHYLENE PRODUCTION AND LNG TRANSPORTATION

Robert H. Harvey, Short Hills, N.J., assignor to Esso Research and Engineering Company

Filed Jan. 2, 1968, Ser. No. 695,140
Int. Cl. C07c 3/30, 11/01
U.S. Cl. 260—683 R 11 Claims

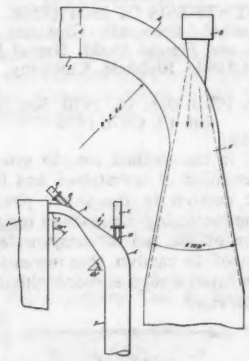


The instant disclosure is directed to a process wherein ethylene production, liquefied natural gas transportation, and ethylene purification are advantageously integrated to mutual benefit. A large economical cracking facility is provided at the source of the natural gas and by performing the cracking operation at this location, improvements in the overall manufacturing economics are achieved.

3,663,645
LIQUID QUENCH

Rolf K. Dorn, Berkeley Heights, and Maldwyn J. Maddock, Westfield, N.J., and Salvatore A. Guerrieri, Rowayton, Conn., assignors to The Lummus Company, Bloomfield, N.J.

Filed Feb. 2, 1970, Ser. No. 7,707
Int. Cl. C07c 3/00; C10g 9/12
U.S. Cl. 260—683 19 Claims

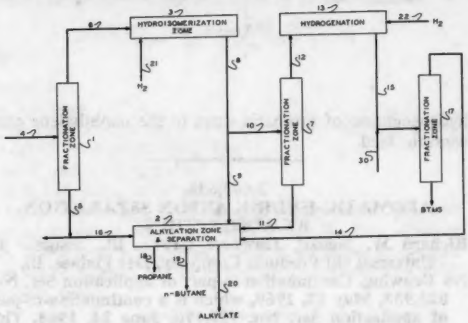


A method and an apparatus for quenching hot gases obtained in treatment of hydrocarbons. A stream of hot gaseous hydrocarbons issues from a reactor and is conveyed in a conduit. In the immediate vicinity of the outlet connecting the reactor with the conduit the latter is provided with a long radius bend of at least approximately 45° to facilitate the injection of cooling liquid concurrently and coaxially into the stream of hot gaseous hydrocarbons without obstruction of the flow path for the hot gaseous hydrocarbons, in order to avoid any flow disturbance of the stream of hot gaseous hydrocarbons passing through the conduit. Downstream of this bend the conduit diverges to constitute a diffusor. The bend is associated with at least one fluid-injecting nozzle which injects the cooling liquid, such as recycled or recirculated hydrocarbons, into the outlet portion of the bend.

3,663,646
ALKYLATION WITH CHARGE STOCK FROM ISOMERIZATION AND HYDROGENATION REACTIONS

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed July 15, 1970, Ser. No. 55,031
Int. Cl. C07c 3/50
U.S. Cl. 260—683.4 R 5 Claims

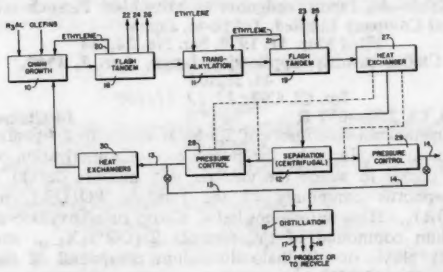


An alkylation feedstock comprising butene-1, butene-2, isobutylene and n-butane is fractionated to produce streams which are isomerized to convert the butene-1 to butene-2, or which are hydrogenated to convert the isobutylene to isobutane. A plurality of streams are thus directed to alkylation to provide increased yield of alkylate.

3,663,647
PROCESS FOR THE PRODUCTION OF OLEFINS

Carroll W. Lanier, Baker, La., assignor to Ethyl Corporation, New York, N.Y.

Filed Aug. 27, 1969, Ser. No. 853,306
Int. Cl. C07c 3/10
U.S. Cl. 260—683.15 D 27 Claims



Olefins in the range of 6–20 carbon atoms are prepared by feeding lower olefin (e.g., ethylene), lower alkyl organometallic (e.g., triethyl aluminum) and product olefin into a reaction system in which chain build up occurs (e.g., chain growth or catalytic polymerization). The reaction effluent is flashed to remove product olefin and lower boiling olefin. The remainder of the effluent contains higher alkyl organometallic and is subjected to an alkyl displacement reaction using lower olefin (e.g., ethylene) to give a mixture of olefins (both in and outside of product range) along with lower alkyl organometallic. This mixture is converted to a mixed vapor-

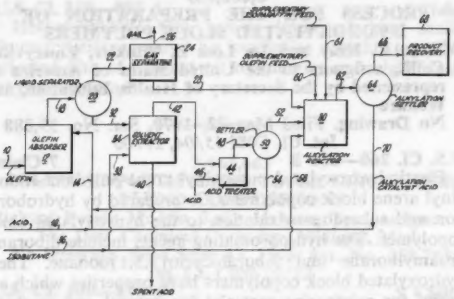
mist system where olefins having more than about 16 carbon atoms per molecule are in the mist phase and the volatile components are in the vapor phase and the vapor-mist system is separated into two respective streams in an inertia separator. The vapor phase component stream is then furnished as feed to the first-named reaction system.

3,663,648

ISOPARAFFIN ALKYLATION WITH DIALKYL SULFATES INCLUDING THE ABSORPTION, EXTRACTION AND ACID-TREATMENT THEREOF

Raymond J. Ruble, Dobbs Ferry, N.Y., assignor to Texaco Development Corporation, New York, N.Y.

Filed Oct. 6, 1970, Ser. No. 78,537
Int. Cl. C07c *3/54*
U.S. Cl. 260—683.61 1 Claim



Isoparaffin-olefin alkylation provides for C_3–C_5 olefin absorption with used sulfuric acid. A hydrocarbon phase containing a minor portion of dialkyl sulfates is separated, gaseous components are removed, and the degassed hydrocarbon phase is passed to the alkylation reaction. The acid phase containing a major portion of dialkyl sulfates is extracted with an isoparaffin hydrocarbon solvent; the extract is treated with concentrated sulfuric acid; the acid-treated extract is passed to the alkylation reaction, and the treating acid is passed to the absorption reaction. The dialkyl sulfates are alkylated with isoparaffin in the presence of an alkylation acid, which is formed in the reaction of said dialkyl sulfates with said isoparaffin.

3,663,649

THERMOPLASTIC OLEFINIC SILOXANE-ETHYLENE POLYMER BLOCK COPOLYMERS

Marshall L. Wheeler, Jr., Olean, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 422,037, Dec. 29, 1964, which is a continuation-in-part of application Ser. No. 356,944, Apr. 2, 1964. This application June 1, 1970, Ser. No. 42,494
Int. Cl. C08g *47/10*; C08f *29/10*
U.S. Cl. 260—827 10 Claims

This invention relates to thermoplastic siloxane-ethylene polymer block copolymers consisting essentially of at least one siloxane block consisting essentially of hydrocarbylsiloxane groups and at least one ethylene polymer block consisting essentially of ethylene groups, said hydrocarbyl groups being monovalent hydrocarbon groups free of aliphatic unsaturation, said ethylene polymer block being derived from a solid ethylene polymer having a molecular weight of at least 1800 and said siloxane block being linked to said ethylene polymer block by a silicon to carbon bond.

The block copolymers of this invention are useful as surfactants in olefin polymers (e.g., as additives to polyethylene to improve the anti-block and anti-slip properties thereof).

3,663,650

SUBSTANTIALLY TRANSPARENT POLYDIMETHYLSILOXANE - POLYALKYLMETHACRYLATE COMPOSITIONS AND METHOD FOR MAKING SAME

Peter C. Juliano, Scotia, N.Y., assignor to General Electric Company

No Drawing. Filed Dec. 28, 1970, Ser. No. 102,086
Int. Cl. C08g *47/10*; C08f *29/50*
U.S. Cl. 260—827 17 Claims

A method, and binary polydimethylsiloxane-polyalkylmethacrylate block copolymers made by such method are provided involving the use of certain dilithio aromatic initiators. The transparent binary polydimethylsiloxanepolyalkylmethacrylate block copolymers can be blended with clear polyalkylmethacrylate plastics to produce substantially transparent thermoplastic films, sheets and coatings having improved surface characteristics.

3,663,651

THERMAL-RESISTANT POLYIMIDE-EPOXY POLYMERS

George Robert Traut, Danielson, Conn., assignor to Rogers Corporation, Rogers, Conn.

No Drawing. Filed Sept. 3, 1970, Ser. No. 69,434
Int. Cl. C08g *45/12*
U.S. Cl. 260—830 P 10 Claims

Cross-linked, polyimide-epoxy polymers are prepared by reacting polyamide-acids, derived from the reaction of an excess of an organic dianhydride with an organic diamine with epoxy compounds, followed by curing the resultant reaction product, usually by heating, to give the polyimide-epoxy polymers.

3,663,652

POLYURETHANE RESINS IN ADMIXTURE WITH POLYEPOXIDES

John Allister Cannon and Jerome Earl Malone, Toms River, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Oct. 27, 1970, Ser. No. 84,468
Int. Cl. C08g *45/12*, *45/08*, *45/10*
U.S. Cl. 260—830 P 10 Claims

Compositions comprising carboxyl containing polyurethane resins and di- or polyepoxide resins. The compositions when cured have excellent adhesion to untreated and treated substrates, excellent flexibility and good resistance to chemical attack.

3,663,653

POLYTETRAHYDROFURAN MODIFIED BLOCK COPOLYESTER THERMOPLASTIC MOLDING COMPOSITIONS

Helmut Frohlich, Wilmington, Del., and Ludwig Brinkman, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 2, 1969, Ser. No. 838,670
Claims priority, application Germany, July 9, 1968, P 17 70 823.5
Int. Cl. C08g *39/10*, *49/04*
U.S. Cl. 260—860 9 Claims

Modified polyesters from aromatic dicarboxylic acids and aliphatic and/or cycloaliphatic diols, which contain from 0.5 to 15 percent by weight of polytetrahydrofuran blocks obtained from a polytetrahydrofurandiol having a molecular weight of from 300 to 5000 (hydroxyl number 375 to 22) as structural units. These modified polyesters are distinguished by a high crystallization speed and can be worked up in the thermoplastic range to yield dimensionally stable shaped articles.

3,663,654

FLAME RETARDANT COMPOSITION OF POLYPHENYLENE ETHER, STYRENE RESIN AND PHOSPHORUS

William R. Haaf, Voorheesville, N.Y., assignor to General Electric Company, New York, N.Y.

No Drawing. Filed Feb. 24, 1969, Ser. No. 801,805
Int. Cl. C08g *43/02*
U.S. Cl. 260—874 15 Claims

A blend of a polyphenylene ether and a styrene resin characterized by the addition of a small but effective quantity of elemental phosphorus. The polyphenylene ethers are flame retardant. The admixture of a polyphenylene ether with a styrene resin destroys flame retardant properties. In accordance with the present invention, it has been found that the addition of elemental phosphorus, preferably elemental red phosphorus in small amounts, typically from 0.1 to 5% of the total composition, provides a blend having excellent flame retardant properties. Moreover, other properties of the blend are not materially affected by the addition of the phosphorus.

3,663,655

POLYMERISATION PROCESS

Alan Charles Sturt, Guildford, England, assignor to BP Chemicals Limited

No Drawing. Filed May 14, 1970, Ser. No. 37,306
Claims priority, application Great Britain, May 19, 1969, 25,418/69
Int. Cl. C08f *1/11*
U.S. Cl. 260—875 5 Claims

Process comprising mixing a non-film forming polymer in latex form with a monomer, destroying the latex emulsifying agent so that the latex polymer particles pass into the monomer without substantial change in size and polymerising the monomer, preferably under suspension conditions.

3,663,656

PROCESS FOR MAKING NOVEL GRAFT COPOLYMER BLENDS

Emory A. Ford, Hampden, and Speros P. Nemphos, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed June 22, 1970, Ser. No. 48,563
Int. Cl. C08f *41/12, 37/18*
U.S. Cl. 260—876 R 13 Claims

A latex of a rubbery polymer having a particle size of less than 0.25 micron and a polymerizable vinylidene monomer formulation is subjected to polymerization conditions to produce polymerization and grafting of at least a portion of the monomer formulation onto the rubbery polymer. Subsequently, a latex of agglomerated rubbery polymer having a particle size of 0.35–1.2 microns is added to the polymerizing latex and polymerization of the vinylidene monomer formulation is continued to produce grafting of at least a portion thereof onto the agglomerated rubbery polymer.

3,663,657

EMULSION-SUSPENSION GRAFT COPOLYMERIZATION PROCESS

Alan Charles Sturt, Guilford, England, assignor to BP Chemicals Limited, London, England

No Drawing. Filed May 14, 1970, Ser. No. 37,356
Claims priority, application Great Britain, May 19, 1969, 25,418/69
Int. Cl. C08f *1/11, 29/24*
U.S. Cl. 260—878 R 5 Claims

Process comprising mixing a saturated polymer in latex form with vinyl chloride, destroying the latex emulsifying agent so that the polymer particles pass into the vinyl chloride and polymerising the latter, preferably under suspension polymerisation conditions.

3,663,658

POLYESTER COMPOSITIONS AND AIR-DRYING COMPOSITIONS THEREOF

Frank Scardiglia, Woodcliff Lake, N.J., and Israel J. Dissen and Takeo Hokama, Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 826,699, May 21, 1969, which is a continuation-in-part of application Ser. No. 554,301, June 1, 1966. This application Apr. 30, 1970, Ser. No. 33,501
Int. Cl. C08f *21/00, 21/02*
U.S. Cl. 260—869 13 Claims

This invention discloses new air drying polyester compositions comprising the adduct of maleic acid or anhydride and trans-piperylene; an unsaturated dicarboxylic compound selected from the group consisting of maleic acid, maleic anhydride and fumaric acid; and glycol.

3,663,659

PROCESS FOR THE PREPARATION OF HYDROXYLATED BLOCK POLYMERS

William C. Kray and De Loss E. Winkler, Emeryville, Calif., assignors to the United States of America as represented by the Secretary of Health, Education, and Welfare

No Drawing. Filed May 22, 1970, Ser. No. 39,888
Int. Cl. C08f *15/04, 27/00*
U.S. Cl. 260—880 B 7 Claims

Elastic hydroxylated monovinyl arene-polydiene-monovinyl arene block copolymers are prepared by hydroboration and subsequent oxidation to the hydroxylated block copolymer. The hydrobromating agents include diborane, disiamylborane and 9-borabicyclo[3.3.1]nonane. These hydroxylated block copolymers have properties which are useful for reinforcing material for natural and synthetic rubber, for modification of rubber-based adhesives and due to their particular swellability for fabrication of devices for surgical implantation and for blood circulation in animals.

3,663,660

PROCESS FOR THE PREPARATION OF A CATALYST USEFUL FOR THE POLYMERIZATION OF OLEFINS

Andre Delbouille and Yves Gobillon, Brussels, and Jacques Stevens, Braine-l'Alleud, Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed June 18, 1969, Ser. No. 834,391
Claims priority, application France, June 20, 1968, 156,199
Int. Cl. C08f *1/56, 3/06*
U.S. Cl. 260—88.2 16 Claims

Improved catalysts for the polymerization of olefins which comprise an organometallic compound and the reaction produced of a liquid halogenated derivative of a transition metal and a solid support constituted by an oxide of calcium and/or magnesium are provided. The solid supports for the improved catalysts are obtained by the heat treatment of an optionally hydrated, carbonate or basic carbonate of calcium or magnesium at a temperature between 350 and 1000° C.

3,663,661

RUBBER MODIFIED POLYPHENYLENE ETHER AND PROCESS

Arthur Katchman, Delmar, N.Y., assignor to General Electric Company

No Drawing. Filed Mar. 9, 1970, Ser. No. 17,940
Int. Cl. C08f *29/12, 41/12*
U.S. Cl. 260—892 20 Claims

This invention relates to rubber modified polyphenylene ether compositions and to a method for forming the same. The method comprises polymerizing a monomeric phenol to a high molecular weight polyphenylene ether

in a reaction medium containing solvated rubber and recovering polymeric components from solution in the form of a precipitate by admixture of said reaction medium with a non-solvent precipitant. After drying, the recovered precipitate comprises a free flowing powder consisting of the polyphenylene ether and the rubber which powder is suitable for molding operations such as extrusion, cold forming and the like.

3,663,662
HEAT-SHRINKABLE FILMS FROM ETHYLENE POLYMER BLENDS
Ralph Crosby Golike, Tonawanda, N.Y., and George Joseph Ostapchenko, Williamsville, and William Drake Garlington, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Aug. 23, 1968, Ser. No. 754,953
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 A **4 Claims**

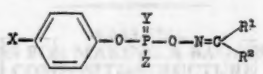
Heat-shrinkable film having improved heat sealing characteristics prepared by irradiative crosslinking of an oriented film of a blend of low density and high density ethylene polymers.

3,663,663
POLYOLEFIN-ETHYLENE/ESTER COPOLYMER BLEND COMPOSITIONS
Richard Bernie McAda, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Sept. 13, 1968, Ser. No. 759,763
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 B **9 Claims**

A new polyethylene blend having improved stress cracking properties, said blend comprising a high molecular weight polyethylene and a copolymer of ethylene and an ester comonomer, such as ethyl acrylate, isobutyl acrylate and vinyl acetate, the copolymer having a molecular weight below 15,000 and the ester comonomer moiety in the range from about 20 to about 65 weight percent. A method for preparing said blend wherein the copolymer is introduced into the polyethylene in the molten state as it passes from the polymerization zone.

3,663,664
OXIMINO ESTERS OF ORGANOPHOSPHORUS AND ORGANOTHIOPHOSPHORUS COMPOUNDS
Lawrence A. Retallick, Perry, Ohio, Lawrence E. Limpel, Yonkers, N.Y., and Henry Bluestone, University Heights, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio
No Drawing. Filed May 5, 1969, Ser. No. 821,939
Int. Cl. C07f *9/06;* **A01n** *9/36*
U.S. Cl. 260—944 **17 Claims**

Novel oximino esters of para-substituted-phenyl phosphorus and thiophosphorus compounds have the formula



wherein X is nitro, cyano, azido, trihalomethyl, carboalkoxy or alkanesulfonyl; Y is O or S; R^1 and R^2 can be the same or different and are selected from the group consisting of H, alkyl radicals of 1–6 C atoms and phenyl; and Z is selected from the group consisting of alkyl and alkoxy radicals each having 1–6 C atoms, phenyl, Cl and

wherein R^3 and R^4 are as defined for R^1 and R^2. Many of these compounds are prepared by reacting an oxime with either a para-substituted-phenyl phosphorochloridate, a similarly substituted thiophosphorochloridate or phenylthiophosphonic chloride under alkaline conditions. Novel alkylidenimino para-substituted-phenyl phosphorochloridates and analogous thiophosphorochloridates are also disclosed.

3,663,665
O-CYCLOALKYL-S-ALKYL-O-HALOPHENYL-PHOSPHOROTHIOLATES
Toyohiko Kume and Shizuo Higashikawa, Tokyo, Japan, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed June 3, 1969, Ser. No. 830,133
Claims priority, application Japan, June 18, 1968, 43/41,619
Int. Cl. C07f *9/18;* **A01n** *9/36*
U.S. Cl. 260—958 **2 Claims**

O-alkyl(-cycloalkyl)-S-alkyl-O-halophenyl - phosphorothiolates, i.e. O-alkyl and cycloalkyl-S-alkyl-O-chloro-and bromo-substituted-phenyl- -phosphorothiolates or -thiolphosphates, which possess fungicidal properties and which may be produced by conventional methods.

3,663,666
METHOD OF FORMING SILICONE RUBBER ARTICLES
Bird J. Vincent, Ingersoll Township, Midland County, Mich. (2775 Smith Crossing Road, Freeland, Mich. 48623)
No Drawing. Filed May 22, 1970, Ser. No. 39,916
Int. Cl. B01j *2/02*
U.S. Cl. 264—13 **4 Claims**

A method of making powdered silicone rubber comprising the formation of a solvent dispersion by dispersing in a volatile solvent a silicone rubber stock together with any desired additives and a silica filler for the stock in an amount equal to at least 30 parts by weight per 100 parts stock and then spray drying the solvent dispersion. Silicone rubber articles are then formed from the powder by adding a curing agent to the powder, applying pressure and shear forces on a mill or in an extruder to cause massing of the powder and then shaping and curing the massed material.

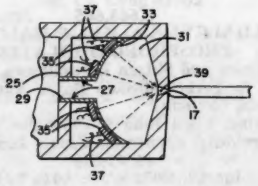
3,663,667
PROCESS FOR PRODUCING METAL POWDERS
Richard F. Cheney and James S. Smith, Towanda, Pa., assignors to Sylvania Electric Products Inc.
No Drawing. Filed Feb. 13, 1970, Ser. No. 11,354
The portion of the term of the patent subsequent to Mar. 28, 1989, has been disclaimed
Int. Cl. B01j *2/04*
U.S. Cl. 264—14 **10 Claims**

Multimetal alloy powders are produced by a process wherein an aqueous solution of at least two thermally reducible metallic compounds and water is formed, the solution is atomized into droplets having a droplet size below about 150 microns in a chamber that contains a heated gas whereby discrete solid particles are formed and the particles are thereafter heated in a reducing atmosphere and at temperatures from those sufficient to reduce said metallic compounds to below the melting point of any of the metals in said alloy.

3,663,668
SONIC NUCLEATION IN FOAM EXTRUSION
Theodore H. Fairbanks, West Chester, Pa., assignor to FMC Corporation, Philadelphia, Pa.
Filed Feb. 28, 1968, Ser. No. 708,870
Int. Cl. B06b *1/06;* **B29d** *27/00*
U.S. Cl. 264—23 **4 Claims**

Method in which a gas is dissolved within a molten thermoplastic polymer during its passage through an extruder to provide a super-saturated solution of dissolved

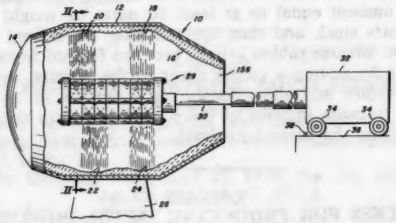
gas therein as such polymer approaches and enters a region of lower pressure outwardly of the extruder. At a location near the beginning of the zone of the supersaturated solution of dissolved gas, the thermoplastic polymer is subjected to sonic vibrations to cause incipient bubble formation therein. Such bubbles are permitted to expand in the region of lower pressure, after which the thermoplastic polymer is quenched.



3,663,669
METHOD FOR SELECTIVELY PROJECTING REFRACTORY MATERIAL AGAINST THE LINING OF BASIC OXYGEN FURNACES

Leonard W. McConnell, 3629 St. Davids Road, Newtown Square, Pa. 19073

Original application Jan. 6, 1969, Ser. No. 789,202, now Patent No. 3,533,375, dated Oct. 13, 1970. Divided and this application June 24, 1970, Ser. No. 49,239
Int. Cl. F27d *1/16, 3/06*
U.S. Cl. 264—30 3 Claims

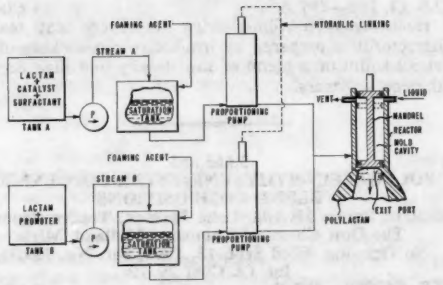


A method for selectively applying pulverulent or granular refractory material to the worn or eroded portions of a refractory lining. A container having a plurality of compartments, each divided into separate sections or quadrants, is secured to an end of a boom that is supported by a vehicle. Pulverulent refractory material is positioned in certain of the isolated sections or quadrants of each of the compartments depending upon the areas of the furnace refractory lining that are worn and eroded so that refractory can be directed to eroded areas. The container has an axial passageway in which an explosive material is positioned. The container secured to the end of the boom is moved into a predetermined position within the furnace while the furnace is at an elevated temperature, preferably immediately after the molten metal has been tapped and slag dumped prior to charging for ensuing heat. The explosive within the axial passageway is then detonated to propel the pulverulent refractory against the wet, plastic lining. The container is fabricated so that the outer cylindrical walls, especially the sections of the segments enclosing the quadrants or sections containing the pulverulent refractory, are frangible and are ruptured, torn and bent by the force of the explosion so that the pulverulent refractory material is selectively propelled through the openings formed in the ruptured outer wall against the refractory lining. Another embodiment provides separate explosive charges in each of the quadrants filled with the refractory material that are detonated by separate detonators. A still further embodiment includes the use of a pressurized source of gas positioned externally of the vehicle.

3,663,670
PLUG FLOW METHOD FOR MOLDING FOAMED POLYLACTAMS

Kenneth G. Swayne, Hockessin, Del., and Henry L. Dragun, Glen Burnie, Md., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 20, 1967, Ser. No. 647,405
Int. Cl. B29d *23/08, 27/04;* C08g *20/12, 20/16, 22/44, 53/08*
U.S. Cl. 264—53 29 Claims

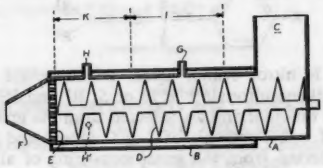


Foamed expanded polylactams are prepared by anionically polymerizing lactam in a mold cavity in the presence of foaming agent under pressure sufficient to maintain foaming agent in the lactam, i.e., monomeric lactam or polylactam. Then, after polymerization is substantially complete, pressure on the polylactam is reduced by opening an exit port and ejecting the shaped solid polylactam out of the mold cavity into an area of lower pressure thus producing cellular polylactam of low density and high tensile strength.

3,663,671
PROCESS FOR THE CONTINUOUS MANUFACTURE OF MARBELIZED SOAP BARS

Reinhold Walter Meye, Krefeld, and Gunter Thor, Krefeld-Traar, Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Apr. 23, 1969, Ser. No. 818,756
Claims priority, application Germany, May 2, 1968, P 17 67 353.9
Int. Cl. B29b *1/04;* B29f *3/12;* C11d *13/08*
U.S. Cl. 264—75 8 Claims



Process for the continuous manufacture of marbelized soap bars involving the use of a soap plodder provided with a conical nozzle and wherein dye solutions are introduced into the soap mass through at least two inlets arranged in the jacket for the plodder, at least one of

the inlets being arranged so that it is separated from the input end of the screw by at least one screw thread and from the outlet end by three to seven screw threads, and at least one additional inlet which is arranged at the first to third screw thread from the discharge end of the screw, the distance between the two inlets amounting to at least one screw thread.

3,663,672
PROCESS FOR PREPARING A PARISON FOR BLOW MOLDING

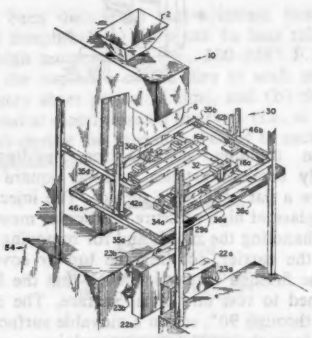
Calvin L. Button, Cedar Rapids, and Waldemar E. Woods, Greenville, S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Continuation of application Ser. No. 563,752, July 8, 1966, now Patent No. 3,504,396. This application Sept. 18, 1969, Ser. No. 858,964

The portion of the term of the patent subsequent to Apr. 7, 1987, has been disclaimed

Int. Cl. B29c *17/07, 17/14*

U.S. Cl. 264—96 **7 Claims**



A process for converting an open ended tubular member into a sealed parison and transferring the still molten parison from the preparation zone to the molding zone. A molten tube of plastic material is extruded downwardly through a die and a first transverse seal is formed in a tube portion spaced from the die while the tube remains connected to the die. A second transverse seal is formed immediately below the first seal and above a previously formed seal to form a sealed tubular section containing fluid. The sealed tube is separated between the first and second seals and conveyed to a molding zone by continuing the sealing grasp of the second seal. The sealed section of the tubing is maintained molten throughout the process and the process is repeatedly carried out on the extruded tube, fluid being injected into the tube above each first seal while the tube is connected to the die.

3,663,673
PROCESS FOR MAKING A BAGASSE PITH COMPOSITE STRUCTURE

Jose A. Rionda, Beverly Hills, Jamaica, assignor to Esso Research and Engineering Company

No Drawing. Original application May 22, 1967, Ser. No. 640,391. Divided and this application Oct. 1, 1969, Ser. No. 870,985

Int. Cl. D21b *1/08*

U.S. Cl. 264—113 **3 Claims**

The process for the manufacture of a composite fiberboard structure from pith and fibrous portions of bagasse which comprises forming a felted mat of bagasse pith, fines and coarse fibers the fines being distributed on the surfaces, thereafter applying a resin to the surface and applying heat and pressure to cure the composite board.

3,663,674
DENSIFICATION OF POLY-α-OLEFINS

Allan D. Holiday, Overland Park, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed July 1, 1969, Ser. No. 838,351

Int. Cl. B01j *2/20*

U.S. Cl. 264—118 **4 Claims**

Poly-α-olefins are prepared in a dense granular form suitable for molding or extrusion by the application of sufficient mechanical energy to compress and collapse the porous polymer particles recovered from the polymerization reactor.

3,663,675
PROCESS FOR PRODUCING CRIMPED POLYPROPYLENE FILAMENTS

Noboru Fukuma, Kenichi Matsui, and Hiroshi Shimizu, Nobeoka-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Continuation-in-part of application Ser. No. 869,450, Oct. 21, 1969, which is a continuation of application Ser. No. 706,674, Feb. 19, 1968. This application July 24, 1970, Ser. No. 58,207

Claims priority, application Japan, Feb. 28, 1967, 42/12,268

Int. Cl. D01d *5/22*

U.S. Cl. 264—168 **3 Claims**

Crystalline polypropylene having an intrinsic viscosity of 1.2 to 2.2 which is obtained by depolymerizing polypropylene having an intrinsic viscosity of 1.2 to 4.2 by a depolymerization degree of at most 1.9 and at most 20% by weight of additives is melt-spun through a spinneret at a temperature of 260 to 280° C. and at a spinning speed of more than 600 m./min. to form undrawn filaments. The resultant undrawn filaments having an intrinsic viscosity of 0.8–1.4 are heat treated at a temperature of 120–150° C., drawn at a temperature of 110–150° C., and thereafter relaxed to produce finely crimped filaments having a large number of crimps and good crimp retention ability.

3,633,676
PROCESS FOR TEMPORARILY REDUCING THE CRIMP INDEX IN BICOMPONENT ACRYLIC FIBERS

Arthur Lulay, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 24, 1968, Ser. No. 700,021

Int. Cl. D01d *5/22*

U.S. Cl. 264—168 **4 Claims**

An improved process for producing helically crimped acrylic bicomponent fiber, which temporarily reduces the crimp index of the fiber comprising: heating the moist fiber under critical temperature, time, and tension conditions in such a manner that the original crimp index is substantially recoverable by a subsequent boil-off.

3,663,677
PROCESS FOR TREATING ELASTOMERIC FIBERS

Herbert W. Keuchel, Summit, N.J., assignor to Celanese Corporation of America, New York, N.Y.

No Drawing. Continuation of application Ser. No. 377,074, June 22, 1964. This application July 13, 1970, Ser. No. 56,191

Int. Cl. B29c *25/00*

U.S. Cl. 264—210 F **5 Claims**

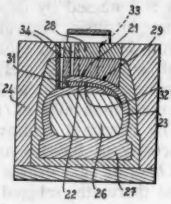
An improved elastomeric fiber and method for producing the same are disclosed and claimed which method comprises stabilizing the crystalline structure of a spun elastomeric fiber by treating the fiber with a swelling solvent therefor while maintaining the fiber in a state of stress. Preferably, the fibers treated are segmented elastomeric copolymers. These preferred elastomeric fibers are preferably polyurethane-containing polymers. The re-

sulting fibers have improved physical properties particularly as measured in reduced permanent setting characteristics.

3,663,678
METHOD OF USING SHRINKABLE PLASTICS
Joseph T. Miller, St. Louis County, Mo., assignor to Sinclair & Rush, Inc., St. Louis, Mo.
No Drawing. Filed Sept. 8, 1969, Ser. No. 856,167
Int. Cl. B29c 17/02
U.S. Cl. 264—230 6 Claims

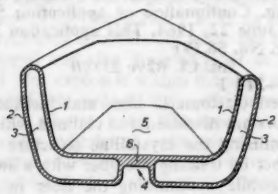
A shrinkable synthetic polymer part produced by swelling the part in solvent with subsequent "freezing" of the part in the enlarged state. The expanded part can be applied over the part to be covered and shrunk by the application of heat or solvent. The part preferably is of polyvinyl chloride.

3,663,679
METHOD OF MANUFACTURING FOOTWEAR
Jean-Gabriel Barre, Lyon, and Jean-Marie Diez, Chassieu, France, assignors to Centre Technique du Cuir, Lyon, France
Filed May 6, 1969, Ser. No. 822,109
Claims priority, application France, May 9, 1968, 50,000; June 17, 1968, 50,114
Int. Cl. A43d 65/00
U.S. Cl. 264—244 8 Claims



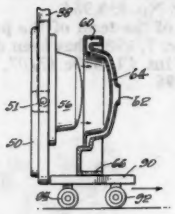
A method of molding an article of footwear from a liquid product, characterized in that said liquid product is polymerizable and cross-linkable at ambient temperatures. Liquid products, such as polyesters, polyurethanes, or elastomers, of different hardnesses or colors can be used successively to fill only desired parts of the mold to create different zones. The desired zones of the article are manufactured by using interchangeable removable cores, and plugs with pour holes and vents, the casting of the article interrupted to permit removal of a core and insertion of a plug, but said interruption being of such duration that the previously cast material is not fully polymerized. The mold and last may be constituted of the same material as the article of footwear to be manufactured.

3,663,680
METHOD OF MOULDING SHAPED ARTICLES WITH HOLLOW WALLS
Lars Ringdal, Montebelloveien 15, Oslo 3, Norway
Filed Sept. 30, 1969, Ser. No. 862,170
Int. Cl. B29c 5/04
U.S. Cl. 264—294 6 Claims



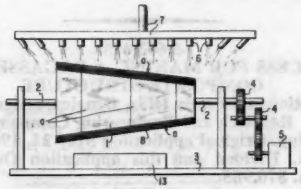
The method disclosed is one in which a hollow-walled article, such as a boat, is formed by sintering plastic material in a mould to form substantially spaced inner and outer walls having the desired thickness and thereafter moving the walls relatively toward each other to form connections at desired points while the plastic material is still hot, soft and adhesive so that completely firm and solid connections are formed.

3,663,681
METHOD FOR HANDLING CAST ARTICLES
Josef Ehrlich, Pacific Palisades, Calif., assignor to Winbrook China, Inc., Santa Monica, Calif.
Filed Jan. 26, 1970, Ser. No. 5,536
Int. Cl. B28b 1/26, 7/12
U.S. Cl. 264—238 3 Claims



Injection molding method for molding articles, particularly ceramic articles such as square lavatories which have a flat back edge surface. The injection molding takes place at high pressure. Particular means are provided for handling the molds and for removing the top or cover of the carrier, rotating the top or cover and removing the finished cast article such that the finish piece is positioned to rest on its flat surface. The cast article is rotated through 90°, set on a movable surface and then separated from the mold cover by applying pressure which moves the article and the movable surface a small amount. The apparatus facilitates handling of the molds and makes possible rapid and repeated use of the mold and thereby greatly augments their utility.

3,663,682
ROTARY MOLDING METHOD
Haruo Nitta and Naotoshi Sagawa, Yokkaichi-shi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan
Filed Sept. 8, 1969, Ser. No. 855,872
Claims priority, application Japan, Sept. 18, 1968, 43/66,972
Int. Cl. B29c 5/04
U.S. Cl. 264—310 5 Claims



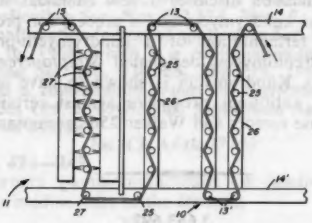
An irregular rotary mold carries external cooling liquid retaining devices along peripheral areas which are normally difficult to cool. The retaining devices permit a uniform cooling of the synthetic resin article after melting the resin and forming the article.

3,663,683

POLYESTER HEAT RELAX PROCESSES

Alfred E. Czerkas and Roger B. Kenyon, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 9, 1969, Ser. No. 840,252
Int. Cl. B29c 25/00; B29d 7/22, 7/24
U.S. Cl. 264—346 4 Claims



It has been discovered that oriented, heat-set, poly-(ethylene terephthalate) films can be heat relaxed at extremely high temperatures (i.e., 300–350° F.), provided (a) that the exposure of the film to such temperatures is for a very short period of time, and (b) that the film is supported at closely spaced intervals (i.e., at most about 15 inches) during the exposure thereof to such extremely high temperatures.

ERRATUM

For Class 264—299 see:
Patent No. 3,662,693

3,663,684

CARCINOEMBRYONIC ANTIGEN AND DIAGNOSTIC METHOD USING RADIOACTIVE IODINE

Samuel Orkin Freedman, Westmount, Phil Gold, Cote St. Luc, and John Henry Krupey, Montreal, Quebec, Canada, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed June 1, 1970, Ser. No. 38,069
Int. Cl. A61k 27/04; G01n 31/08
U.S. Cl. 424—1 22 Claims

Methods for ioslating, identifying and detecting carcinoembryonic antigen which originates in the digestive system epithelium derived from embryonic entodermal tissue are disclosed.

3,663,685

BIODEGRADABLE RADIOACTIVE PARTICLES

Roger L. Evans, Sunfish Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Apr. 1, 1968, Ser. No. 717,965
Int. Cl. A61k 27/04
U.S. Cl. 424—1 13 Claims

Particles, preferably substantially spherical particles having a smooth outer surface and essentially void-free interior are produced, consisting essentially of solid, cold-water insoluble vehicle comprising a physiologically acceptable, parenterally metabolizable protein or polysaccharide having dispersed therein a water-insoluble carrier loaded with radioisotopes, which are substantially non-leachable upon short term exposure to cold water. Such particles can be administered parenterally for diagnostic purposes, or for treatment with radioactive materials. On administration in this way, they are broken down or solubilized by the body fluids over a predeterminable period ranging from minutes to several days, whereupon the radioisotopic material is excreted from the body thus limiting exposure to the radiation.

3,663,686

BIODEGRADABLE RADIOACTIVE PARTICLES

Ivan M. Grotenhuis, Blaine, and David O. Kubiatowicz, Arden Hills, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Apr. 24, 1968, Ser. No. 723,885
Int. Cl. A61k 27/04
U.S. Cl. 424—1 7 Claims

Particles, preferably substantially spherical particles having a smooth outer surface and essentially void-free interior are produced, consisting essentially of solid, cold-water insoluble vehicle comprising a physiologically acceptable, parenterally metabolizable radioactive protein, said particles being substantially non-leachable upon short term exposure to cold water. The particles can be administered parenterally for diagnostic, prophylactic or therapeutic purposes. On administration in this way, they are broken down or solubilized by the body fluids over a predeterminable period ranging from minutes to several days, whereupon the radioisotopic material is excreted from the body thus limiting exposure to the radiation.

3,663,687

BIODEGRADABLE PARENTERAL MICROSPHERULES

Roger L. Evans, Sunfish Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed June 26, 1968, Ser. No. 740,038
Int. Cl. A61k 27/04
U.S. Cl. 424—1 16 Claims

Tiny substantially spherular particles having a smooth outer surface and essentially void-free interior, are produced consisting essentially of solid, cold-water insoluble material comprising a physiologically acceptable, parenterally metabolizable protein, said spherules being capable of being made radioactive after their preparation, and said radioactivity being substantially non-leachable upon short term exposure to cold water. They can be used as carriers for substances, e.g. radioisotopes, which are administered parenterally for diagnostic, prophylactic or therapeutic purposes. On administration in this way, they provide a predeterminable dwell time and thereafter are broken down or solubilized by the body fluids over a predeterminable period ranging from minutes to several days. Thereafter the radioisotopic or other material is excreted from the body thus terminating exposure to the carried substance.

3,663,688

DIAGNOSTIC MATERIAL AND PROCESS USING CHELATED RADIOACTIVE YTTERBIUM

Ivan M. Grotenhuis, Blaine, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed June 26, 1968, Ser. No. 740,050
Int. Cl. A61k 27/04; C07f 5/00
U.S. Cl. 424—1 16 Claims

Compositions of matter comprising radio-ytterbium and a chelating agent therefor, the said compositions being

soluble in water and body fluids and having a stability constant above about 10^{15}, are used by parenteral administration to study the kidneys and the brain in warm-blooded animals. The chelating agent prevents the dissipation of the chemically active radio-nuclide into body tissues other than the kidneys, since chelates, although soluble, are preferentially excreted by the kidney. A useful diagnostic tool is provided.

3,663,689

DESTAINED GENTIAN VIOLET AND METHOD

Karl J. Karnaky, Houston, and James E. McShane, Dallas,, Tex., assignors to Savage Laboratories, Inc., Houston, Tex.

No Drawing. Continuation-in-part of application Ser. No. 614,797, Feb. 9, 1967, which is a continuation-in-part of application Ser. No. 266,487, Mar. 20, 1963, which in turn is a continuation-in-part of application Ser. No. 730,534, Apr. 24, 1958. This application July 14, 1969, Ser. No. 841,560

Int. Cl. A61k *9/00; A61l 23/00*

U.S. Cl. 424—45 **8 Claims**

A destained gentian violet mixture comprising from about 22 to about 27 parts of a clay or clays from the montmorillonite group absorbing from about 0.25 to about 3.00 parts gentian violet. From about 7 to about 14 parts of polyvinylpyrrolidone (plasdone) may be added. The clay or the combined clay and polyvinylpyrrolidone should comprise not less than 16 parts by weight to each part of gentian violet. Bentonite and a mixture of bentonite and kaolin are preferred. Cornstarch may be added. A suitable solvent, such as water, the alcohols, chloroform, and the like are used in preparing the destained gentian violet mixture. The preparation may be in the form of a cream, an aerosol foam, an aerosol powder, a powder, a jelly or a tablet. In a cream or foam form the clay or mixture of clay from about 22% to about 27% and plasdone in excess of 7%, preferably 9–14%, of the total products should be present. Dispersing agents, solubilizing agents, viscosity regulators, wetting agents, antiseptics, preservatives and the like may be incorporated in the preparation.

3,663,690

MUCOLYTIC COMPOSITION AND METHOD OF TREATMENT OF BRONCHO-PULMONARY DISORDERS THEREWITH

Hermann J. Eichel and Kenneth R. Hickey, Cincinnati, and Frank R. Springman, Cleves, Ohio, assignors to American Hoechst Corporation, Somerville, N.J.

No Drawing. Filed Aug. 12, 1969, Ser. No. 849,487

Int. Cl. A61k *19/00*

U.S. Cl. 424—94 **1 Claim**

Pharmaceutically active compositions for treatment of broncho-pulmonary disorders containing an N-substituted cysteine derivative together with desoxyribonuclease, both of which act as mucolytic agents, each on its respective substrate.

It is known that certain compounds containing free mercapto groups can be used as mucolytic agents in the treatment of pulmmonary disorders. Such compounds lower the viscosity of respiratory mucous secretions by a mechanism involving the cleavage of disulfide linkages of mucoprotein. It is also known that desoxyribonuclease treatment of pulmonary disorders. Such compounds rapidly degrades desoxyribonucleoprotein (and desoxyribonucleic acid), thus decreasing the viscosity of purulent material.

3,663,691

KUNDRYMYCIN AND PROCESS FOR ITS PRODUCTION

Donald E. Nettleton, Jr., Jordan, James A. Bush, Fayetteville, and William T. Bradner, Manlius, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Sept. 3, 1970, Ser. No. 69,220

Int. Cl. A61k *21/00*

U.S. Cl. 424—121 **3 Claims**

The specification discloses a new chemical substance referred to as kundrymycin and a process for production thereof by fermentation of a kundrymycin-producing strain of Streptomyces, designated *Streptomyces metachromogenes*. Kundrymycin is shown to have antibiotic activity and antitumor properties against certain transplanted mouse tumors and Walker 256 carcinosarcoma.

3,663,692

METHODS OF BIRD CONTROL

Morley R. Kare, 215 Fairview Road, Narberth, Pa. 19072

No Drawing. Continuation-in-part of application Ser. No. 585,286, Oct. 10, 1966. This application Dec. 29, 1969, Ser. No. 888,844

Int. Cl. A01n *9/12, 9/22, 11/00*

U.S. Cl. 424—153 **10 Claims**

Bird populations are controlled and mortality is increased by applying a bio-affecting composition which can be absorbed through a bird's feet to roosting and nesting areas. A particularly preferred composition comprises caffeine carried in a low volatile liquid such as glycerin or vegetable oil.

3,663,693

ANTIMALARIAL COMPOSITIONS AND METHODS OF THEIR USE

Ralph G. Slighter, Nassau, and Dicran A. Berberian, Colonie, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 536,630, Mar. 23, 1966. This application Aug. 31, 1967, Ser. No. 664,635

Claims priority, application Great Britain, Mar. 16, 1967, 12,497/67

Int. Cl. A61k *27/00*

U.S. Cl. 424—229 **12 Claims**

The invention relates to a method for combatting malarial parasites in a host species by administering a 2-sulfanilamido - 5 - (lower-alkoxy)pyrimidine alone or in combination with one or more clincially effective antimalarial agent(s), and to a composition containing an antimalarially effective dosage of said combination of drugs.

3,663,694

IODOPHOR DAIRY SANITANTS

Sean Geoffrey Hall, Belfast, Northern Ireland, assignor to Kilco Chemicals Limited, Belfast, Northern Ireland

No Drawing. Continuation-in part of application Ser. No. 656,342, July 27, 1967. This application Dec. 19, 1968, Ser. No. 785,331

Claims priority, application Great Britain, July 27, 1966, 33,712/66

Int. Cl. A61l *13/00*

U.S. Cl. 424—238 **5 Claims**

An iodophor udder sanitising agent for cows contains an alkoxylated lanolin derivative in place of part or all of the conventional non-ionic surfactant used heretofore, complexed with iodine. If another non-ionic surfactant is present, it may be a surfactant with or without terminal hydroxyl groups.

3,663,695

ANTICOCCIDIAL COMPOSITIONS CONTAINING QUATERNARY 5 - AMMONIUMMETHYL - 4-AMINO - 2 - CYCLOALIPHATYL-PYRIMIDINE SALTS

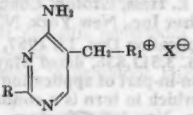
Renat Herbert Mizzoni, Long Valley, and George de Stevens, Summit, N.J., assignors to Ciba Corporation, Summit, N.J.

No Drawing. Continuation-in-part of application Ser. No. 620,626, Mar. 6, 1967, which is a continuation-in-part of application Ser. No. 592,314, Nov. 7, 1966, which is a continuation-in-part of application Ser. No. 572,671, Aug. 16, 1966, which is a continuation-in-part of application Ser. No. 534,666, Mar. 16, 1966, which in turn is a continuation-in-part of application Ser. No. 493,233, Oct. 5, 1965. This application Apr. 25, 1969, Ser. No. 819,459

Int. Cl. A61k *27/00*

U.S. Cl. 424—249 17 Claims

Quaternary 5-ammoniummethyl - 4 - amino-2-cycloaliphatylpyrimidine salts of the formula



R=cycloalkyl, cycloalkenyl, cycloalkylalkyl and cycloalkenylalkyl

$R_1\oplus$=ammonium group of which the nitrogen atom is part of a heterocyclic radical

$X\ominus$=anion of an acid

and acid addition salts thereof, exhibit anticoccidial effects.

3,663,696

TREATMENT OF DEPRESSION WITH 2-CHLORO-11 - (PIPERAZINYL)DIBENZ - [b,f][1,4]OXAZEPINES AND ACID ADDITION SALTS THEREOF

Charles Frederick Howell, Upper Saddle River, and Robert Allis Hardy, Jr., Ridgewood, N.J., and Nicanor Quinones Quinones, New York, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 551,544, May 20, 1966, which is a continuation-in-part of application Ser. No. 348,271, Feb. 28, 1964. This application July 22, 1970, Ser. No. 57,307

Int. Cl. A61k *27/00*

U.S. Cl. 424—250 8 Claims

The preparation of 2-chloro-11-(1-piperazinyl)dibenz-[b,f][1,4]oxazepine by heating ethyl 4-{[o-(p-chlorophenoxy)phenyl]carbamoyl}-1-piperazine carboxylate with phosphorus pentoxide and phosphorus oxychloride, is described. The base compound and pharmacologically acceptable acid addition salts are useful for their antidepressant effect on the central nervous system of warm-blooded animals.

3,663,697

3 - METHYLQUINOXALINE - 2 - CARBOXAMIDE-1,4-DIOXIDES FOR THE CONTROL OF *SALMONELLA CHOLERAESUIS* INFECTIONS

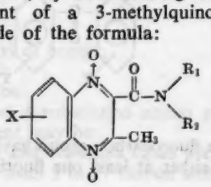
Lloyd H. Conover, Quaker Hill, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed Oct. 7, 1970, Ser. No. 78,920

Int. Cl. A61k *27/00*

U.S. Cl. 424—250 6 Claims

A method for the control of Salmonella infections in domestic animals, particularly *Salmonella choleraesuis* infections in swine, by administering to the animals an effective amount of a 3-methylquinoxaline-2-carboxamide-1,4-dioxide of the formula:



wherein

X is a 6- or a 7-position substituent selected from hydrogen, chloro, bromo, fluoro, methyl, methoxy and trifluoromethyl;

R_1 is hydrogen or alkyl having from one to four carbon atoms;

R_2 is hydrogen, methyl or ethyl, with the proviso that the total number of carbon atoms in R_1 and R_2 is not greater than four.

3,663,698

1,4-SUBSTITUTED-PYRIMIDIN-2(1H)-ONES FOR RELIEF OF PAIN AND INFLAMMATION

Goetz E. Hardtmann, Florham Park, N.J., and Hans Ott, Basel-Land, Switzerland, assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,200

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 27 Claims

The present invention discloses compounds of the class of 1-substituted-4-aryl-pyrimidin-2(1H)-ones, methods and intermediates for preparation of said compounds, and pharmaceutical methods and compositions based on said compounds and useful in therapy, for example, in the treatment of inflammation in animals.

3,663,699

METHOD OF TRANQUILIZING EMPLOYING N,N'-DIALKOXYMETHYL PHENOBARBITAL

John F. Reinhard and Carlos M. Samour, Wellesley, and Julius A. Vida, Boston, Mass., assignors to The Kendall Company, Walpole, Mass.

No Drawing. Continuation-in-part of application Ser. No. 867,865, Oct. 20, 1969. This application May 19, 1971, Ser. No. 145,053

Int. Cl. A61k *27/00*

U.S. Cl. 424—254 2 Claims

A series of N,N'-dialkoxymethyl phenobarbitals have been found to be useful as tranquilizers, analgesics and centrally acting skeletal muscle relaxants.

3,663,700

THERAPEUTIC HYPOTENSIVE COMPOSITIONS COMPRISING CALCIUM SALTS OF 5-ALKYL-PICOLINIC ACIDS

Hamao Umezawa, 23, 4-chome, Toyotama-kita, Nerima-ku, Tokyo, Japan, and Toshiharu Nagatsu, 3610–81 Aza-Higashiyama, Nabeya-ueno-machi, Chigusa-ku, Nagoya-shi, Aichi-ken, Japan

No Drawing. Continuation-in-part of application Ser. No. 798,116, Feb. 10, 1969. This application Nov. 24, 1970, Ser. No. 92,176

Int. Cl. A61k *27/00*

U.S. Cl. 424—266 3 Claims

Calcium 5-butylpicolinate and calcium 5-pentylpicolinate having hypotensive activity.

3,663,701

SUBSTITUTED THIOCYANO PYRROLES, FUNGICIDAL PREPARATIONS CONTAINING THESE COMPOUNDS AS ACTIVE INGREDIENTS AND METHODS OF USING THE SAME

Stig Hjalmar Johannes Akerstrom, Uppsala, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

No Drawing. Original application Dec. 19, 1966, Ser. No. 602,598. Divided and this application Sept. 15, 1969, Ser. No. 858,123

Claims priority, application Sweden, Dec. 20, 1965, 16,447/65

Int. Cl. A01n *9/12, 9/22*

U.S. Cl. 424—274 3 Claims

Substituted dithiocyanopyrroles have been found to be useful as antifungal agents for combatting plant harmful fungi.

3,663,702

PHARMACEUTICAL COMPOSITIONS CONTAINING AMIDES OF β-(3 - THIANAPHTHENYL) ETHYLAMINES

John T. Suh, Mequon, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Original application May 5, 1967, Ser. No. 636,274, now Patent No. 3,528,994, dated Sept. 15, 1971. Divided and this application Apr. 17, 1970, Ser. No. 29,680

Int. Cl. A61k *27/00*

U.S. Cl. 424—275 5 Claims

Pharmaceutical compositions containing as an active ingredient an amide of β-(3-thianaphthenyl)ethylamines are useful in controlling antisocial aggressive behavior in animals. A composition containing N-iso-butyryl-3-(β-aminoethyl)thianaphthene is disclosed.

3,663,703

LAXATIVE PHARMACEUTICAL AND METHODS OF USE

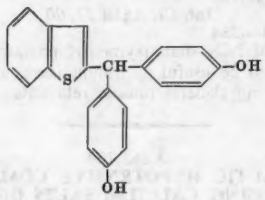
Ronald J. Meyer, Orville E. Horsley, and Herman J. Eichel, Cincinnati, Ohio, assignors to American Hoechst Corporation, New York, N.Y.

No Drawing. Original application June 26, 1968, Ser. No. 740,091. Divided and this application May 27, 1970, Ser. No. 51,408

Int. Cl. A61k *27/00*

U.S. Cl. 424—275 3 Claims

Bis(4-hydroxyphenyl)thianaphthyl-2 - methane having laxative (cathartic) properties of the formula:



and a process for preparing it.

3,663,704

AGRICULTURAL FUNGICIDE AND BACTERICIDE, A PROCESS FOR THE PREPARATION OF SAME AND A PROCESS FOR CONTROLLING RICE BLAST

Katsumichi Aoki, Iwaka, Elizaburo Uchida, Sendai, and Kiichi Shinoda and Takafumi Shida, Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Continuation-in-part of application Ser. No. 754,744, Aug. 22, 1968. This application June 24, 1970, Ser. No. 49,509

Claims priority, application Japan, Aug. 30, 1967, 42/55,172; Apr. 22, 1968, 43/26,560

Int. Cl. A01n *9/28*

U.S. Cl. 424—279 6 Claims

Novel fungicidal compositions for agricultural use containing 4,5,6,7-tetrachlorophthalide as an active ingredient and method for controlling rice blast by applying said compound or compositions thereof to rice plants. The compounds and compositions of the present invention are also useful as agricultural bactericide, particularly in the control of bacterial leaf blight in rice plants.

3,663,705

ANIMAL GROWTH PROMOTERS

Richard N. Hurd, Terre Haute, Ind., assignor to Commercial Solvents Corporation, New York, N.Y.

No Drawing. Filed Apr. 6, 1970, Ser. No. 26,123

Int. Cl. A61k *27/00*

U.S. Cl. 424—281 20 Claims

An animal feed, especially for meat-producing animals such as swine, ruminants, poultry, etc., which contains an amount of 3-(p-loweralkoxyphenyl) or 3-(p-hydroxyphenyl) or 3-(p-benzyloxyphenyl)-4-n-propyl-7-hydroxycoumarin effective to promote the rate of growth, e.g., weight gain, and feed conversion of the animal being fed.

3,663,706

USE OF 2,4-DIAMINOQUINAZOLINES AS HYPOTENSIVE AGENTS

Hans-Jurgen E. Hess, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Application Dec. 13, 1967, Ser. No. 690,101, now Patent No. 3,511,836, dated May 12, 1970, which is a continuation-in-part of application Ser. No. 555,704, June 7, 1966, which in turn is a continuation-in-part of application Ser. No. 469,879, Aug. 6, 1965. Divided and this application Sept. 29, 1969, Ser. No. 871,171

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 11 Claims

Novel 2,4-diaminoquinazolines wherein at least one of the 6- or 7-positions is substituted with alkoxy having from 1 to 3 carbon atoms and acid addition salts thereof, the preparation thereof and the utility thereof as hypotensive agents.

3,663,707

MOLLUSCICIDAL OXIME CARBAMATES

Johannes Th. W. Montagne, Sittingbourne, and Willem A. van Tongeren, Herne Bay, England, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Jan. 9, 1970, Ser. No. 1,861

Claims priority, application Great Britain, Jan. 21, 1969, 3,323/69

Int. Cl. A01n *9/20*

U.S. Cl. 424—300 4 Claims

Novel use of oxime carbamates as molluscicides.

3,663,708

N-ARYL-N-FLUOROALKYLSULFONYL CARBAMATES

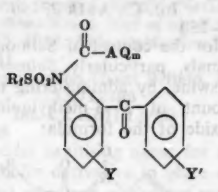
Joseph Kenneth Harrington, Edina, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Apr. 8, 1968, Ser. No. 719,746

Int. Cl. A61k *27/00*; C07c *143/74*

U.S. Cl. 429—300 12 Claims

N-carbonylfluorocarbonsulfonanilides of the general formula:



wherein R_f is a fluorocarbon group having 1 to 4 carbon atoms, having either at least one fluorine atom attached

to the alpha carbon atom or if there is no fluorine atom attached to the alpha carbon atom, having at least two fluorine atoms attached to hte beta carbon atom, A is —O—, —S—, —N< or a single carbon-carbon bond, Q is a hydrocarbon group containing up to 14 carbon atoms, *m* is 1 or 2 and Y and Y′ are the same or different and are hydrogen, halogen, lower alkyl, hydroxy or lower alkoxy. These compounds have valuable physiological activity as anti-inflammatory agents.

3,663,709

NEMATOCIDAL USE OF PHENYLTHIOMETHYL N-METHYLDITHIOCARBAMATE

John J. D'Amico, Akron, Ohio, and David L. Gerwitz, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Dec. 15, 1969, Ser. No. 885,359
Int. Cl. A01n *9/12*
U.S. Cl. 424—300 **4 Claims**

The life cycle of parasitic nematodes is terminated by applying a nematocidal amount of phenylthiomethyl N-methyldithiocarbamate to nematode infested soil.

3,663,710

METHODS AND COMPOSITIONS FOR IMPROVING FEED EFFICIENCY OF RUMINANTS USING BIS-POLYHALOMETHYL DERIVATIVES

Roger C. Parish, King of Prussia, and John E. Trei, Malvern, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed Feb. 12, 1970, Ser. No. 10,981
Int. Cl. A61k *27/00*
U.S. Cl. 424—301 **16 Claims**

Methods and compositions utilizing bis-polyhalomethyl derivatives improve the feed efficiency of commercial ruminant animals by inhibiting methanogenesis in the rumen. Preferred compounds to be used as active ingredient are hexachloroethane and trichloroethyl carbonate.

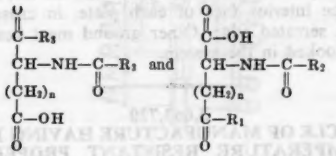
3,663,711

METHODS FOR PRODUCING GASTROINTESTINAL ANTISECRETORY ACTION

Giorgio Da Re, Milan, and Luigi Rovati, Monza, Italy, assignors to Rotta Research Laboratorium S.p.A.

No Drawing. Original application July 23, 1965, Ser. No. 474,450, now Patent No. 3,551,419, dated Dec. 29, 1970. Divided and this application Mar. 26, 1970, Ser. No. 30,616
Claims priority, application Italy, July 31, 1964, 25,676/64
Int. Cl. A61k *27/00*
U.S. Cl. 424—309 **4 Claims**

Compounds having the following formula:



wherein:

R_2 is either phenyl or benzyl;
n is either 1 or 2;
R_1 and R_3 may be:

(a) mono- and di-substituted amino groups in which the substituent may be:

(i) linear and branched chain alkyl radicals containing from 3 to 17 carbon atoms when *n* is 2;

(ii) linear and branched chain alkyl radicals having from 1 to 17 carbon atoms when *n* is 1; and

(iii) a carboalkoxy-substituted phenyl group;

(b) a heterocyclic group which is a morpholino-, piperidinopyrrolidino- 4-antipyrilamino- and hexamethyleneimino radical;

(c) a benzylamino radical when *n* is 1.

The above compounds exert either a depressing or stimulating effect on the central nervous system, and are particularly effective as anti-secretory agents in the gastrointestinal tract of warm-blooded mammals. Numerous examples of environments wherein the compounds of the present invention find utility are disclosed in the specification.

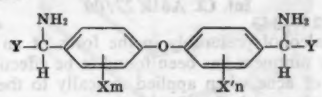
3,663,712

4,4′-BIS(ALPHA-AMINO SUBSTITUTED) DIPHENYL ETHERS AS ANTIMICROBIAL AGENTS

Bogislav von Schmeling, Hamden, Conn., and Walter R. Boos, Guelph, Ontario, Canada, assignors to Uniroyal, Inc., Middleburg, Conn., and Uniroyal, Ltd., Montreal, Quebec, Canada

No Drawing. Filed Sept. 25, 1969, Ser. No. 861,153
Int. Cl. A01n *9/20*
U.S. Cl. 424—330 **16 Claims**

4,4′-bis(alpha-amino substituted) diphenyl ethers of the formula:



where the X's are for example halogen or alkyl, and the Y's are for example alkyl, phenyl, or substituted phenyl, are useful as agricultural or industrial bactericides and fungicides. Typical chemicals are 4,4′-bis(alpha-amino-m-methylbenzyl) diphenyl ether and 4,4′-bis(alpha-aminoethyl) diphenyl ether. Agricultural uses of the chemicals include control of bean halo blight caused by the bacterium *Pseudomonas phaseolicola*.

3,663,713

NAPHTHYL ACETALDEHYDE DERIVATIVES, METHODS OF USE THEREOF

John Fried and Ian T. Harrison, Palo Alto, Calif., assignors to Syntex Corporation, Apartado, Panama

No Drawing. Continuation-in-part of application Ser. No. 741,900, July 2, 1968. This application Apr. 9, 1969, Ser. No. 814,855
Int. Cl. A61k *27/00*
U.S. Cl. 424—333 **9 Claims**

2-(2′-naphthyl) acetaldehyde derivatives optionally substituted at the 2 position and/or positions C–1′,4′,5′,7′ or 8′; and/or position C–6′ or positions C–5′ and 7′ exhibit anti-inflammatory, analgesic, antipyretic and antipruritic activity.

3,663,714

1,1,1-TRIFLUORO-2-DIFLUORO-METHOXY PROPANE AS AN ANESTHETIC AGENT

Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc.

No Drawing. Original application Apr. 29, 1968, Ser. No. 725,164. Divided and this application Oct. 9, 1969, Ser. No. 871,048
Int. Cl. A61k *27/00*
U.S. Cl. 424—342 **2 Claims**

The present invention relates to anesthetic compositions containing 1,1,1-trifluoro-2-difluoromethoxy propane, the method of preparing 1,1,1-trifluoro-2-difluoromethoxy propane, and to the method of anesthetizing warm blooded air breathing creatures by administering an effective amount of 1,1,1-trifluoro-2-difluoromethoxy propane.

3,663,715
ETHER COMPOUNDS AS ANESTHETICS
Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc.
No Drawing. Original application May 6, 1968, Ser. No. 727,004. Divided and this application Nov. 3, 1969, Ser. No. 871,050
Int. Cl. A61k 27/00
U.S. Cl. 424—342 8 Claims

The present invention relates to the novel compounds 1,1,2,2-tetrafluoroethyl trichloromethyl ether

$$(CHF_2CF_2OCCl_3)$$

1,1,2,2-tetrafluoroethyl dichloromethyl ether

$$(CHF_2CF_2OCHCl_2)$$

and 1,1,2,2-tetrafluoroethyl fluorochloromethyl ether ($CHF_2CF_2OCHFCl$). The compounds are prepared through selective stepwise chlorination and fluorination of 1,1,2,2-tetrafluoroethyl methyl ether. The compounds are useful as anesthetics and as solvents and dispersants of fluorinated materials.

3,663,716
METHOD OF TREATING ACNE WITH BENZYL ALCOHOL
Morris Emmanuel Stolar, Trumbull, Conn., assignor to Miles Laboratories, Inc., Elkhart, Ind.
No Drawing. Filed June 22, 1970, Ser. No. 48,454
Int. Cl. A61k 27/00
U.S. Cl. 424—343 4 Claims

Benzyl alcohol preferably in the form of an aqueous solution or ointment has been found to be effective in the treatment of acne when applied topically to the affected areas of the human body.

ERRATA

For Classes 99—13 and 260—606 see:
Patent Nos. 3,663,717 thru 3,663,729

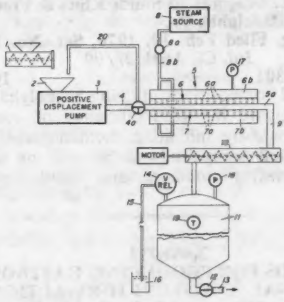
3,663,717
INTERLOCKABLE CONFECTION BARS
Maurice Simon Coster, Tel Aviv, Israel, assignor to Borden, Inc., New York, N.Y.
Continuation of abandoned application Ser. No. 729,569, May 16, 1968. This application Dec. 28, 1970, Ser. No. 102,072
Int. Cl. A63h 33/08
U.S. Cl. 99—137 9 Claims

This invention relates to an elongated rectangular bar of a substantially uniform thickness for mounting a frozen comestible and comprises at least one aperture and at least one pair of transverse aligned notches, said aperture comprising a circle having diametrically opposed notches, the width of said transverse and diametrically opposed notches being greater than the thickness of said bar, the dimension between the inner edges of said transverse notches being less than the diameter of said circle, the dimension between the outer edges of said diametrically opposed notches being greater than the width of said bar.

3,663,718
PROCESS FOR PREPARING CHOCOLATE FLAVORED BANANA POWDER
Robert H. Bundus, Riverside, Ill., assignor to Beatrice Foods Co., Chicago, Ill.
No Drawing. Continuation-in-part of application Ser. No. 652,709, July 12, 1967. This application Oct. 13, 1970, Ser. No. 80,505
Int. Cl. A23b 7/02; A23l 1/27
U.S. Cl. 99—204 5 Claims

Chocolate flavored banana powder is prepared by co-drying a mixture of banana puree and cocoa. The product is less hygroscopic than the original banana solids. Desirably sugar is included in the composition.

3,663,719
SYSTEM FOR COOKING FISH
Richard H. Gnaedinger, St. Louis, Mo., assignor to the United States of America as represented by the Secretary of the Interior
Filed Dec. 3, 1969, Ser. No. 881,785
Int. Cl. A22c 25/00; A23k 1/10
U.S. Cl. 99—7 6 Claims



Ground raw fish is passed through a cooker where it is confined as a thin layer while steam passes into it through both the top and bottom of the layer. A downstream screw conveyor supplies back pressure which prevents steam from blowing fish out of the cooker. Cooked fish, by-products and entrapped steam pass from the screw conveyor to a reservoir. A relief valve on the reservoir maintains a predetermined pressure throughout the system. In its preferred design the cooker includes two perforated parallel plates which confine the fish as a thin layer. The interior face of each plate, in cross-section, defines a serrated edge. Other ground meat besides fish can be cooked in the system.

3,663,720
ARTICLE OF MANUFACTURE HAVING HIGH TEMPERATURE RESISTANT PROPERTIES AND METHOD OF MAKING THE SAME
Henry C. Thompson, Saratoga, Calif., assignor to Thompson Chemicals, Inc., San Carlos, Calif.
No Drawing. Original application Sept. 10, 1965, Ser. No. 486,528, now Patent No. 3,502,610. Divided and this application Sept. 12, 1969, Ser. No. 871,054
Int. Cl. B44d 1/14
U.S. Cl. 117—70 R 3 Claims

The invention relates to making a high temperature resistant glass fiber laminate by impregnating glass fibers

with a condensation product of resorcinol and formaldehyde resins containing between 2 and 6 based in the weight of the condensation product of portland cement. A coating of an enamel alkyd may be applied to the glass fiber laminate.

3,663,721
ELECTROCHEMICAL CELLS WITH LITHIUM ANODE

Alain Blondel, Lillebonne, and Jean-Firmin Jammet, Poitiers, France, assignors to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme), Romainville, France

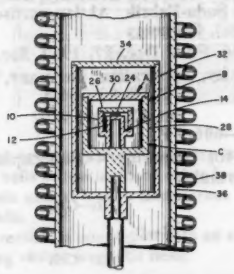
Filed July 31, 1970, Ser. No. 59,993
Claims priority, application France, Aug. 1, 1969, 6926543
Int. Cl. H01m *35/00, 21/00*
U.S. Cl. 136—6 **10 Claims**

Electrochemical cells utilizing lithium anodes prepared by cold extrusion into sheet form. The extruded sheets are severed into prescribed band lengths and the bands are pleated in zig-zag form to provide multiple folds or pleats. Thin cathode plates are positioned between pleats, being insulated from the pleated lithium anode by suitable separating means. The dimension of the cathode plates parallel to the width of the bands is such as to leave a zone along at least one edge of the pleated anode band that has no opposite cathode plate counterpart. Electrical connections are secured to the pleated band in said zone and are in the form of tabs, for example, of stainless steel, spot welded to an expanded metal strip which latter in turn is fastened to said lithium anode band in said zone as by ultrasonic welding. The separating means may be in the form of an enclosing sheath or envelope of insulating material into which the lithium band is inserted prior to pleating or the cathode plates may be individually sheathed in separator material.

3,663,722
METHOD OF MAKING SILICON CARBIDE JUNCTION DIODES

G Sanjiv Kamath, Wellesley, Mass., assignor to Norton Research Corporation, Cambridge, Mass.

Continuation-in-part of applications Ser. No. 810,977, Mar. 27, 1969, and Ser. No. 840,255, July 9, 1969. This application Mar. 5, 1970, Ser. No. 16,855
Int. Cl. H01l *7/38;* C01b *31/36;* B01j *17/24*
U.S. Cl. 148—172 **2 Claims**

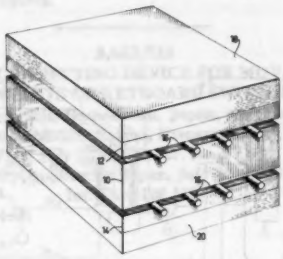


The production of electroluminescent silicon carbide junction diodes is described. These diodes are preferably produced by growth from a silicon carbide or carbon solution in silicon formed between a surface of a p or n-type silicon carbide base crystal and a source of carbon atoms such as a block of solid carbon. The silicon contains one or more p or n-type impurities so that a p-n junction is formed on the crystal. A multistratum epitaxial layer is grown on the base crystal by providing immediately adjacent the base crystal a layer of silicon having one impurity concentration and providing at a remote spot in the reaction zone another mass of silicon having a different impurity concentration. The initial stratum is grown at a relatively low temperature and the second stratum is grown at a higher temperature. The initial stratum can be very thin (less than .0005 inch) and transparent and the second stratum can be opaque and of low resistance dut to codoping with boron and aluminum.

3,663,723
METHOD OF ARMOURING ARTICLES OF METAL

Per Ingemar Persson, Huddinge, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed Sept. 23, 1969, Ser. No. 860,242
Claims priority, application Sweden, Sept. 23, 1968, 12,803/68
Int. Cl. B26b *5/00*
U.S. Cl. 156—179 **4 Claims**

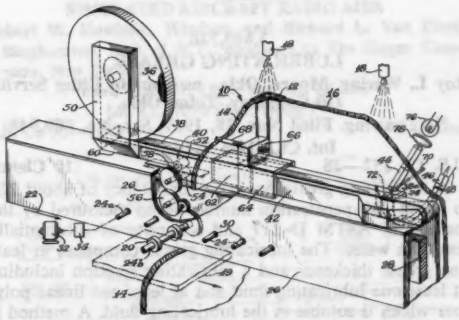


The method of welding metal members to each other and to a reinforcing element located between such members to form a unitary armoured mass by heat and pressure created by the rapid burning and expansion of an explosive material which engages at least one surface of the metal members.

3,663,724
BUILT-IN TYPE SPEED CONTROL FOR CONVEYORIZED CONTINUOUS ETCHER

Robert C. Benton, State College, and Blair W. Heffner, Petersburg, Pa., assignors to Chemcut Corporation, State College, Pa.

Filed Nov. 14, 1969, Ser. No. 876,629
Int. Cl. C23f *1/04*
U.S. Cl. 156—345 **4 Claims**



A continuous spray etching machine is disclosed in which the spray chamber and a longitudinally extending

conveying means therethrough cooperate to cause articles being etched to be continuously advanced through the spray chamber, and in which the spray chamber is provided with a built-in automatic control to control the conveying speed. The control is provided with its own etchable supply of control element strip material, and the strip material is fed by the control into the spray chamber and is therein destructively tested and monitored by the control as a measure of the degree of material removal both from the control element strip and, analogously, from the attendant articles being etched.

3,663,725

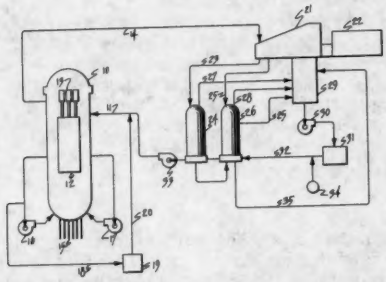
CORROSION INHIBITION

Wesley L. Pearl, San Jose, Calif., assignor to General Electric Company

Continuation of application Ser. No. 680,235, Nov. 2, 1967. This application Apr. 23, 1970, Ser. No. 29,736

Int. Cl. G21c *9/00*

U.S. Cl. 176—38 **4 Claims**



A small proportion of oxygen and hydrogen, preferably about 100 to 300 parts per billion of oxygen and stoichiometric amount of hydrogen, is introduced into the boiler feedwater in an electrical power generating plant so as to decrease the corrosion rate of materials such as carbon steel in the feedwater heater chain. This technique is especially useful in water cooled or moderated nuclear power plants since a suitable supply of oxygen and hydroen are generated by radiolytic decomposition of water in the reactor core and because corrosion products in the water supply are especially harmful in such a plant.

3,663,726

LUBRICATING GREASE

Roy L. Waring, Moore, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

No Drawing. Filed Nov. 28, 1969, Ser. No. 880,948

Int. Cl. C10m *5/14, 5/08*

U.S. Cl. 252—28 **10 Claims**

A lubricating grease having a consistency of about 220 to about 430 penetration number when measured by the method of ASTM D–217 and a density of substantially less than water. The lubricating grease comprises at least one grease thickener and a lubricating fraction including at least one lubricating fluid and at least one linear polymer which is soluble in the lubricating fluid. A method is provided for controlling the consistency of the lubricating grease and the viscosity of the lubricating fraction independent of density, by controlling the amount of the polymer in the grease composition.

3,663,727

PROCESS FOR PURIFICATION OF POLYMER SOLUTION

Akira Yamamoto, Toyoharu Miyako, and Kiyoshi Maeda, Yokkaichi-shi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

No Drawing. Filed Sept. 29, 1969, Ser. No. 862,034

Claims priority, application Japan, Oct. 3, 1968, 43/72,017

Int. Cl. C08d *5/00, 5/02;* **C08f** *1/88*

U.S. Cl. 260—80.78 **8 Claims**

A process for the purification of a polymer solution which comprises removing the polymerisation catalyst from a polymer solution obtained by solution-polymerising a monomer or monomers in a water-immiscible inert organic solvent in the presence of a polymerisation catalyst soluble in said solvent, characterised by mixing said polymer solution with water in the presence of a surface active agent to thereby form a first emulsion of water in polymer solution type, subsequently mixing said first emulsion with additional water to induce phase inversion of said first emulsion to a second emulsion of polymer solution in water type, and separating a water phase from the second emulsion.

3,663,728

PROCESS FOR PRODUCING POLYAMIDE ACID AND POLYIMIDES

John T. Hoback and Fred F. Holub, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed July 25, 1968, Ser. No. 747,460

Int. Cl. C08g *20/32*

U.S. Cl. 260—29.2 N **16 Claims**

Aromatic dianhydrides and diamines are reacted in a solvent comprising at least 40%, by weight of an aliphatic polyol to produce polyamide acid solutions which can be heat-cured to polyimide resins. These polyamide acid solutions can be converted to polyimides and employed as insulation over conducting cores, as laminating varnishes, as dipping varnishes to impregnate coils of previously-insulated wire in the motor and generator rotors, field coils, etc.

3,663,729

PROCESS FOR PREPARING 4-OXAPHOSPHORINANES

Peter Tavs, Limburgerhof, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

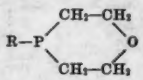
No Drawing. Filed Dec. 17, 1969, Ser. No. 886,044

Claims priority, application Germany, Jan. 8, 1969, P 19 00 706.8

Int. Cl. C07f *9/02*

U.S. Cl. 260—606.5 P **14 Claims**

A process for preparing 4-oxaphosphorinanes having the general formula:



where R denotes an aliphatic radical having one to twenty carbon atoms and a process for the production of the same which comprises reacting a divinyl ether with hydrogen phosphide or a monosubstituted organic phosphine in the presence of actinic light or a substance which decomposes into free radicals under the reaction conditions and also in the presence of a solvent which is inert under the reaction conditions. The products are suitable as modifying agents for cobalt carbonyl complexes.

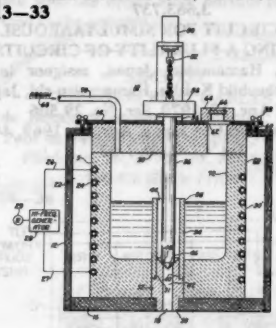
ELECTRICAL

3,663,730

MOLTEN METAL DISPENSING EQUIPMENT

Wilbur C. Gates, Mentor, Ohio, assignor to General Electric Company

Filed Mar. 18, 1971, Ser. No. 125,499
Int. Cl. H05b *9/02*; F27d *3/12*
U.S. Cl. 13—33 **8 Claims**



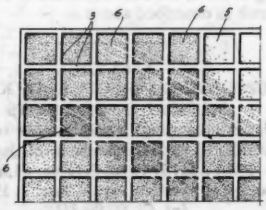
An apparatus is disclosed which automatically dispenses a metered quantity of molten metal from a reservoir of the particular metal and which is particularly suitable for automated casting operations such as ferrous die casting. The apparatus employs an induction heating coil to raise the level of molten metal in the reservoir whereupon the molten metal is poured into a dispensing chamber and thereafter discharged to a mold or other forming equipment.

3,663,731

APPARATUS FOR MAKING VISIBLE MAGNETIC FIELDS BY MEANS OF IRON FILINGS

Anders E. Ofwerstrom, Kullgardsvagen 21, 44300 Lerum, Sweden

Filed July 1, 1969, Ser. No. 838,217
Claims priority, application Sweden, July 8, 1968, 9360/68
Int. Cl. G09b *23/18*
U.S. Cl. 35—19 A **2 Claims**



An educational apparatus for displaying magnetic fields has a plurality of cells bordering each other in a flat unit with iron fillings therein and at least a transparent upper limiting surface on said cells.

The present invention is concerned with an educational apparatus for making visible magnetic field.

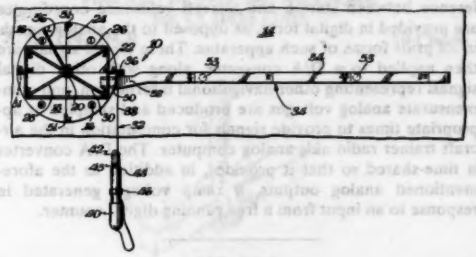
3,663,732

CIRCULAR FUNCTION TEACHING AID

James A. Polk, R. D. #4, West Chester, Pa.

Filed Apr. 16, 1970, Ser. No. 29,178
Int. Cl. G09b *23/04*
U.S. Cl. 35—34 **10 Claims**

A circular function teaching aid includes a pair of concentrically arranged circles which are relatively movable with respect to each other. One of the circles has visible X and Y axes thereon, while the other circle includes a visible rectangle disposed symmetrically with respect to its center and with



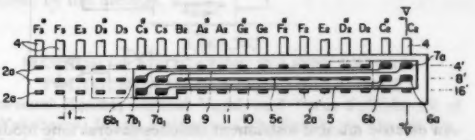
the corners of the rectangle being coarcuate. A visible diagonal line connects diametrically opposite corners of the rectangle. A flexible distance selector is attached tangentially to one of the circles.

3,663,733

INTERCONNECTING DEVICE FOR MOVABLE CONTACTS OF KEYBOARD SWITCHES

Shin-ichi Murakami, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed July 22, 1970, Ser. No. 57,077
Claims priority, application Japan, July 26, 1969, 44/70962
Int. Cl. G10f *1/06*
U.S. Cl. 84—1.01 **3 Claims**



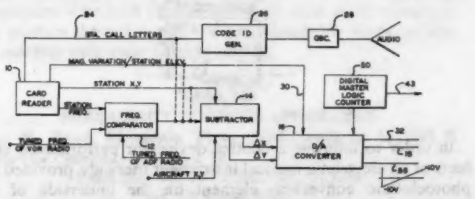
An interconnecting device for movable contacts of multistage keyboard switches in an electronic musical instrument in which a printed circuit board structure capable of interconnecting the movable contacts as groups in place of the conventional individual wirings is used. The device simplifies the complicated wiring operations in manufacture and also troublesome, complex connections in the movable contacts, resulting in elimination of cross-talking due to the existence of stray capacitances caused by unreliable connections.

3,663,734

SIMULATED AIRCRAFT RADIO AIDS

Robert W. Howland, Windsor, and Richard L. Van Fleet, Binghamton, both of N.Y., assignors to The Singer Company, New York, N.Y.

Filed Mar. 27, 1970, Ser. No. 23,314
Int. Cl. G09b *9/08*; G06g *7/78*
U.S. Cl. 35—10.2 **4 Claims**



A system for deriving electrical signals to operate simulated radio and navigation equipment in a fixed-base aircraft

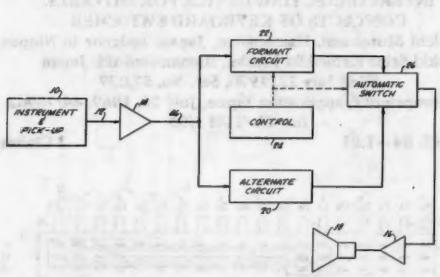
trainer in accordance with assumed fixed data and variable flight information. Data associated with the transmitting stations is programmed on punched cards which are inserted in a static card reader and supplied in digital form to other components for operations combining or comparing such data with digital flight data. Signals representing the difference between station and aircraft reference coordinates are provided in digital form, as opposed to the analog signals in all prior forms of such apparatus. These digital signals are then applied to a D/A converter, along with other digital signals representing other navigational information, and commensurate analog voltages are produced and sampled at appropriate times to provide signals for computation in the aircraft trainer radio aids analog computer. The D/A converter is time-shared so that it provides, in addition to the aforementioned analog outputs, a ramp voltage generated in response to an input from a free running digital counter.

3,663,735

AUTOMATIC ON-OFF CONTROL

Chauncey R. Evans, Costa Mesa, Calif., assignor to Columbia-Broadcasting Systems, Inc., New York, N.Y.

Filed June 1, 1970, Ser. No. 42,155
Int. Cl. G10h *3/00*
U.S. Cl. 84—1.11 **24 Claims**



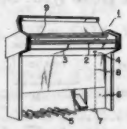
An electric musical instrument includes several tone modifying circuits. One of these is a special effects formant circuit operated by oscillatory motion of a foot control pedal. The formant circuit and another straight through or tone circuit are caused to have mutually exclusive operation by means of a pair of switches in the formant and alternate circuits that are actuated upon motion of the foot control pedal.

3,663,736

CONTROL DEVICE FOR PERFORMANCE EFFECTS OF AN ELECTRONIC MUSICAL INSTRUMENT

Norio Tomisawa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Dec. 23, 1970, Ser. No. 100,896
Claims priority, application Japan, Dec. 25, 1969, 44/122708
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.24 **7 Claims**



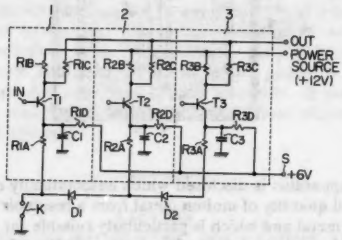
In order to improve a control device for performance effects of an electronic musical instrument there are provided a photoelectric conversion element on the underside of a keybed below the manual keyboard of the electronic musical instrument and also a light source near the front side of the bottom part of the instrument so as to face the photoelectric conversion element. By interrupting a light beam from the source to the photoelectric conversion element with part of the player's body, the resistance of the element is caused to be varied to actuate a relay, thereby permitting the use of circuits of performance effects such as sustain, vibrato and reverberation.

3,663,737

KEYING CIRCUIT FOR SIMULTANEOUSLY SWITCHING A PLURALITY OF CIRCUITS

Yasunori Hirose, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Apr. 17, 1970, Ser. No. 29,506
Claims priority, application Japan, Apr. 21, 1969, 44/36608
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.26 **2 Claims**



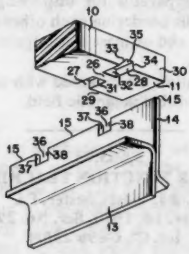
A plurality of circuits employed in an electronic musical instrument and having different time constants are simultaneously switched by a keying circuit according to the present invention which is so organized that the circuits to be switched are arranged in an increasing order of the time constants, a single switch is connected directly to a switching terminal of the firstly arranged circuit having the smallest time constant, and a plurality of diodes are disposed in such a manner that each diode is connected between adjacent switching terminals of the circuits and that the forward direction of the diodes is so arranged as to conduct at a closure of the above said single switch. When the circuits to be switched include one or several groups of circuits having similar time constants, each of such groups of the circuits are commonly connected to a switching terminal and arranged in an increasing order of the time constants to be organized into a keying circuit as described above.

3,663,738

KEY SUPPORTING STRUCTURE OF KEYBOARD MUSICAL INSTRUMENTS

Seizi Nakada, Hamamatsu, Japan, assignor to Nippon Gakki Sugo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Aug. 7, 1970, Ser. No. 61,899
Claims priority, application Japan, Aug. 7, 1969, 44/74592
Int. Cl. G10g *3/12*
U.S. Cl. 84—423 **5 Claims**



To improve the key supporting structure of a keyboard musical instrument, there are formed on both sides of the

rear bottom plane of a key two opposite grooves extending crosswise of the key with an intermediate partition wall located therebetween, and on the upper edge portion of a key supporting plate there is formed a notch corresponding to the intermediate partition wall between the two grooves. The key is supported on the supporting plate by fitting the intermediate partition wall of the key into the notch of the supporting plate with the upper edge portion of the supporting plate received in the grooves.

3,663,739

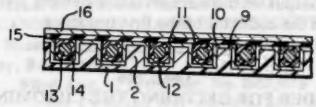
UNIFORM FLAT CABLES

Jean-Claude Jacques Chevrier, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 26, 1970, Ser. No. 83,728

Int. Cl. H01b *11/06*

U.S. Cl. 174—36 **7 Claims**



Flat cables comprising a layer containing polymeric material, polymeric material-containing ribs spaced along the width running substantially the length of the layer of polymeric material forming grooves on the layer of polymeric material, the grooves containing metal conductor, and a covering layer containing metal conductor.

3,663,740

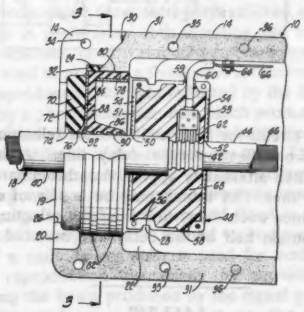
CABLE SPLICE CASE

Harold W. Dellett, P.O. Box 565, Escondido, Calif.

Filed July 15, 1970, Ser. No. 55,143

Int. Cl. H02g *15/08*

U.S. Cl. 174—92 **8 Claims**



A splice case for use on several different types of sheathed or armored multi-conductor telephone and utility cables having the ability of accommodating both double and single sheath cables, on either pressurized or non-pressurized lines for use in buried, conduit or aerial applications. The case includes grippers for securely anchoring the sheaths of the cables to the case to prevent tension loads from damaging the splice, and unique sealing collars for maintaining the moisture-proof integrity of the case when unpressurized and for maintaining positive pressure on pressurized cable systems.

3,663,741

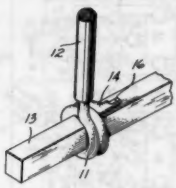
TERMINAL AND WRAPPED WIRE ASSEMBLY

Robert Holbrook Cushman, Lower Moreland Township, Montgomery County, Pa., assignor to Western Electric Company Incorporated, New York, N.Y.

Filed Apr. 16, 1971, Ser. No. 134,808

Int. Cl. H02g *15/08*

U.S. Cl. 174—94 R **10 Claims**



A number of wires are wrapped about a terminal. An insulation-free section of a first wire is initially wrapped about the terminal with a relatively low number of turns, e.g., two, leaving a short end portion which is directed axially along the terminal. The end portion of the first wire is then bonded to the terminal, the bonding operation compacting the end portion. Next, an insulation-free section of a second wire is wrapped about the terminal with a relatively low number of turns, e.g., two, overlapping the bonded and compacted end portion of the first wire, leaving a short end portion which is directed axially along the terminal. The end portion of the second wire is then bonded to the terminal, the bonding operation compacting the end portion. Additional wires may next be added successively in like, overlapping manner. A strong, compact terminal and wrapped wire assembly is formed by this method.

3,663,742

METHOD OF MITIGATING SULFIDE TREES IN POLYOLEFIN INSULATED CONDUCTORS

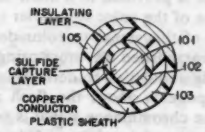
Morikuni Hasebe; Hiroshi Nagai, and Teruo Fukuda, all of Yokohama, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1970, Ser. No. 77,685

Claims priority, application Japan, Oct. 6, 1969, 44/79338

Int. Cl. H01b *7/02*

U.S. Cl. 174—120 SR **10 Claims**



In an electric cable provided with a plastic sheath and an insulating layer consisting of polyolefin series resin applied directly or with the aid of other insulating layer on the copper conductor, polyolefin-series resin insulated electric cable provided in a desired position with a sulfide-capture layer consisting of a polyolefin-series resin composition incorporated with such powder of metals, salts of the metals, or the mixture thereof as to form water-insoluble metal sulfides by reacting with water soluble sulfides.

3,663,743

FREQUENCY DIVIDING APPARATUS

Bert H. Dann, Mountain View, Calif., assignor to Bell & Howell Company, Chicago, Ill.

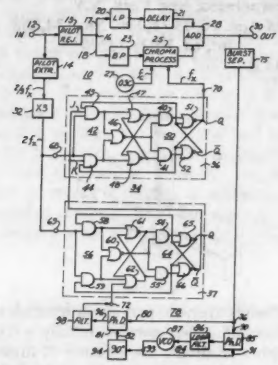
Filed July 21, 1970, Ser. No. 56,788

Int. Cl. H04n *9/44*

U.S. Cl. 178—5.4 CD **7 Claims**

A frequency divider provides an output signal which has a frequency that is divided relative to the frequency of an input

signal and that displays a phase jump in response to a discontinuity in the input signal. This phase jump is sensed and a control signal is provided in response thereto. The frequency



divider is constructed to adjust the phase of the output signal in response to the latter control signal so as to correct the above mentioned phase jump.

3,663,744

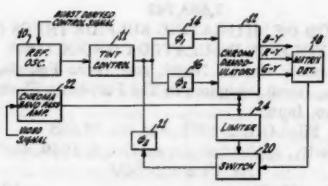
SELECTIVE TINT CORRECTION CIRCUITS

Leopold Albert Harwood, Somerville, N.J., assignor to RCA Corporation

Filed July 22, 1970, Ser. No. 57,280

Int. Cl. H04n 9/12

U.S. Cl. 178—5.4 HE **11 Claims**



Tint correction is provided in a color television system by altering the phase of the color subcarrier reference signal before application of this signal to color demodulators. Phase alteration is accomplished by monitoring the chrominance signals prior to demodulation to determine whether they possess phase components about the flesh axis. If such components exist, the chrominance signal is vectorially added to the reference oscillator signal to provide a new phased oscillator signal which, when applied to the demodulators, causes them to provide color signals representative of flesh tone.

3,663,745

COMPENSATED TELEVISION MATRIX AMPLIFIERS

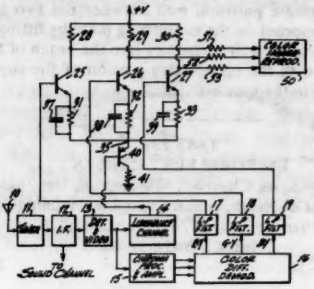
John J. O'Toole, Cherry Hill, N.J., assignor to RCA Corporation

Continuation of application Ser. No. 693,361, Dec. 26, 1967, now abandoned. This application Sept. 21, 1970, Ser. No. 74,135

Int. Cl. H04n 9/52

U.S. Cl. 178—5.4 MA **6 Claims**

A matrix amplifier for color television receivers employs two transistors of opposite conductivity types having their emitters coupled together. The base of a first transistor is coupled to a source of narrow band frequencies, such as color difference signals, which drives the first transistor in a common emitter mode. The base of the second transistor is coupled to a source of wideband signals, such as luminance signals. By virtue of the emitter coupling, the first transistor operates in a common base mode for the wideband signals. A



matrixed output of the narrow and wideband frequencies is taken from the collector of the first transistor.

3,663,746

DECODER FOR DECODING THE CHROMINANCE SIGNAL OF A COLOR TELEVISION SIGNAL

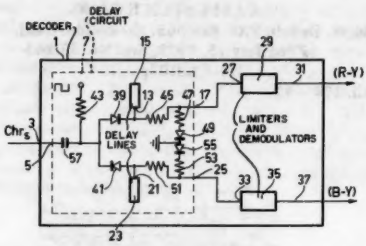
Franciscus Theodorus Backers, and Harry Leman Swaluw, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1969, Ser. No. 809,705

Claims priority, application Netherlands, Apr. 4, 1968, 6804788

Int. Cl. H04n 9/40

U.S. Cl. 178—5.4 S **3 Claims**



A decoder circuit for PAL and SECAM television signals which has two reflection type delay lines. A horizontal frequency switch alternately applies the chrominance signal to the delay lines. The switch may be a pair of diodes or transistors. Since each delay line is of the relecting type, it need only contain half of the delay line material normally required.

3,663,747

TELEVISION RECEIVER WITH PHASE DETECTOR CONTROLLED SOUND SUPPRESSION FILTER

Peter Johannes Hubertus Janssen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 3, 1969, Ser. No. 881,740

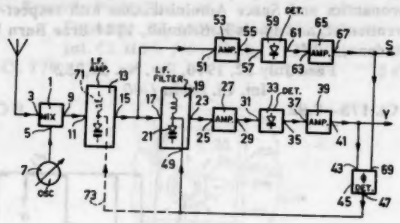
Claims priority, application Netherlands, Dec. 10, 1968, 6817659

Int. Cl. H04n 5/60

U.S. Cl. 178—5.8 R **4 Claims**

A television receiver has video and audio I.F. sections. An audio carrier trap with a varactor tuned diode is located in either a common I.F. section or the video I.F. section. A

phase detector has two inputs coupled to the audio and video sections respectively and an output coupled to the varactor



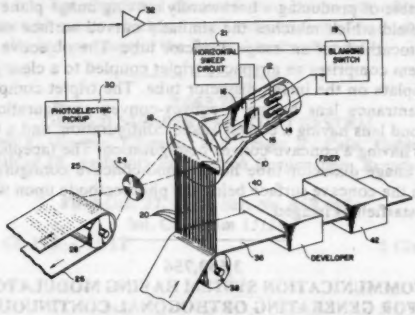
diode. Therefore, as the local oscillator is adjusted, the audio trap is always tuned to the sound carrier.

3,663,748

FACSIMILE SYSTEM UTILIZING SINGLE CRT FOR SCANNING AND IMAGE REPRODUCTION

Joseph L. Boon, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1969, Ser. No. 847,975
Int. Cl. H04n *1/12, 1/30, 1/24*
U.S. Cl. 178—6.6 A **3 Claims**



An electrostatic facsimile system utilized a single cathode ray tube in performing both scanning and image reproduction operations. In one embodiment, one gun of a twin gun tube is used to produce a flying spot for scanning a document to be reproduced. The light reflected by the document is collected by a photomultiplier tube which produces an electrical image signal which is fed, through suitable monitoring means, to the second gun of the cathode ray tube. The external ends of the wire array terminate on the surface of a suitable receiving medium, where an electrostatic image is produced. Such image is then developed and fixed to produce a facsimile of the original. In a second embodiment one electron gun of a cathode ray tube is used for both scanning and image reproduction operations by providing means for switching the beam produced by the signal gun so that it alternately produces a flying spot on the document and produces an electrostatic image on the wire array.

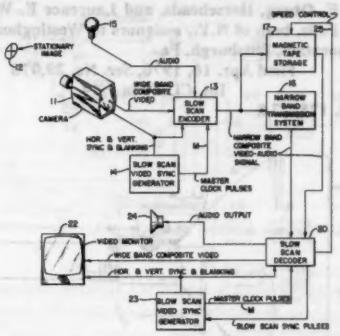
3,663,749

SLOW SCAN VIDEO METHOD AND SYSTEM

Max R. Cannon, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,165
Int. Cl. H04n *7/12*
U.S. Cl. 178—6.8 **10 Claims**

A digital slow scan video conversion method and system for wide band composite video signals generated by a television camera including an encoder with sampling means to progressively sample instantaneous amplitudes of the video signal, and a digital timer generates digital timing pulses quantitized in time in discrete steps relative to the wide band signal frequency to regulate the sampling for producing digital sampling pulses which form a narrow band signal that may be recorded on magnetic tape or transmitted over lines such as telephone lines. A decoder includes a disc-type storage medium storing or recording the digital sampling pulses in series, and a second digital timer generates digital timing pulses to regulate sequence and position of storage of the sampling pulses so as to gradually assemble the sampling pulses in the proper relation over a longer time interval for subsequent readout. Pulse width modulation of the narrow band video signal prior to storage improves the image detail, and pulse code modulation prior to storage provides for a totally digital form of video conversion to afford accurate timing between sampling and reproducing positions of the sampling pulses.

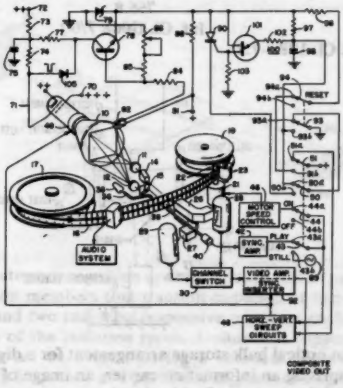


3,663,750

AUTOMATIC BEAM BLANKING CIRCUIT FOR AN ELECTRONIC VIDEO PLAYER

Emil E. Besler, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 16, 1971, Ser. No. 124,789
Int. Cl. H04n *1/22*
U.S. Cl. 178—7.2 **8 Claims**



An electronic video player having a flying spot scanner for producing a raster to scan the film being reproduced therein is capable of operation in a play mode, with the film continuously moving through a film gate where it is scanned, or in a still mode, where movement of the film is stopped and repeated scanning of the stopped film in the film gate is ef-

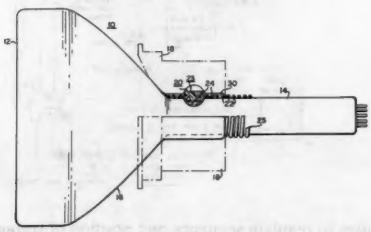
fected. The raster is collapsed for the still mode of operation, and a circuit operates automatically to cut off the beam in the flying spot scanner tube after a predetermined time of operation in the still mode to prevent excessive phosphor burn of the flying spot scanner screen for the collapsed raster.

3,663,751

POTTED ELCTRICAL COMPONENT ASSEMBLY

Albert E. Oberg, Horseheads, and Laurence E. White, Montour Falls, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 16, 1970, Ser. No. 29,073
Int. Cl. H04n *5/64*
U.S. Cl. 178—7.8 **4 Claims**



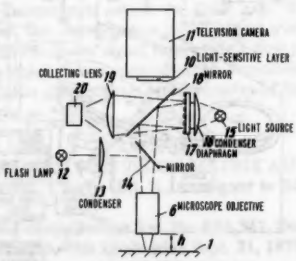
A potted electrical component assembly in which a component is secured to a device such as a cathode ray tube wherein the deflection yoke is potted to the neck of the cathode ray tube by means of a potted sleeve comprised of a cord encircling the neck of the cathode ray and a plastic potting material which solidifies to secure said deflection yoke to the tube neck positioned within the annular space between the deflection yoke and the neck of the tube. The potted sleeve may be removed by pulling out the cord in the direction of the tube axis which unwinds the cored and tears up the plastic potting material.

3,663,752

OPTICAL BULK STORAGE ARRANGEMENT FOR A DIGITAL COMPUTER

Ernst Froschle, Friedrichstr. 42, Aachen, Germany

Filed Oct. 21, 1969, Ser. No. 868,016
Claims priority, application Germany, Oct. 23, 1968, P 18 04 756.8
Int. Cl. G06k *7/00*
U.S. Cl. 178—7.2 **16 Claims**



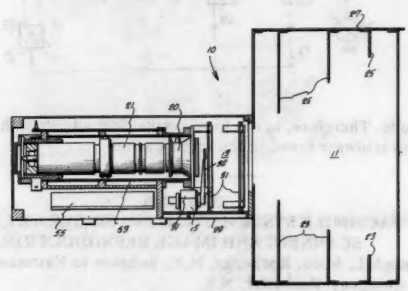
An optical bulk storage arrangement for a digital computer comprising an information carrier, an image of which is projected by means of objective lens means onto a camera device, e.g.: a television camera tube, having means for temporarily storing the image, means for varying the position of the focal plane of the objective lens means relative to the information carrier between two exposures of the camera device and means for initiating an exposure when the focal plane is just passing through the information carrier.

3,663,753

LIGHT SENSOR

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Louis F. Schmidt, 1744 Brae Burn Road, Altadena, Calif.

Filed July 22, 1970, Ser. No. 57,252
Int. Cl. H04n *1/00*
U.S. Cl. 178—7.92 **8 Claims**



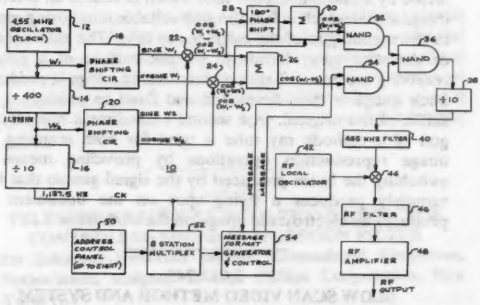
A light sensor is disclosed having an objective lens system capable of producing a backwardly curving image plane of a starfield which matches the similarly curved surface of the photocathode of an image dissector tube. The objective lens system comprises an airspaced triplet coupled to a clear glass faceplate on the image dissector tube. The triplet comprises an entrance lens having a convex-convex configuration, a second lens having a convex-plano configuration, and a third lens having a concave-convex configuration. The faceplate of the image dissector tube has a plano-concave configuration with the concave surface being the photocathode upon which the starfield is imaged.

3,663,754

COMMUNICATION SYSTEM HAVING MODULATOR FOR GENERATING ORTHOGONAL CONTINUOUS PHASE SYNCHRONOUS BINARY FSK

Drexel W. Hanna, Jr., Warminster, Pa., assignor to Totuus Communications, Inc., Horsham, Pa.

Filed May 18, 1970, Ser. No. 38,277
Int. Cl. H03c *3/38*; H04b *1/04*
U.S. Cl. 178—66 A **7 Claims**

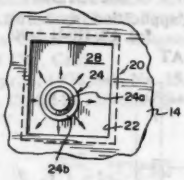


A communication system includes a modulator that generates orthogonal continuous phase synchronous binary frequency shift keying signals derived from a single oscillator without narrowband filters. Digital countdown chains are used to derive all appropriate signals. A transmitter incorporating the modulator and a receiver are also disclosed.

3,663,755
VARIABLE RESISTANCE CONTROL DEVICE

Melvin A. Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Apr. 23, 1970, Ser. No. 31,212
Int. Cl. H04r 5/00; H03g 5/12, 1/02
U.S. Cl. 179—1 D 5 Claims

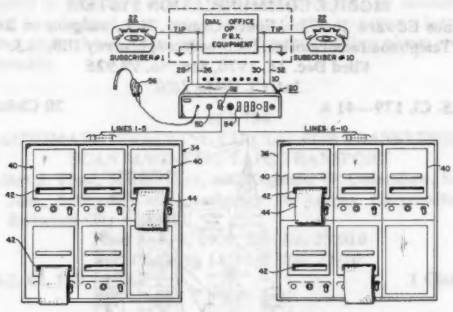


A variable impedance device for controlling a plurality of independent functions from a single control shaft means. The control shaft means has a two dimensional movement by manually sliding the shaft means within a confined space so as to change the resistive component between a contactor associated with the control shaft means and a plurality of fixed points of terminal connection formed on a flat resistance element over which the contactor moves during the adjustment. The control shaft means extends through a nonconductive plate and has associated therewith two knobs and other resistance elements which are used independent of one another and also independent of the flat resistance element.

3,663,756
DIALED NUMBER PRINTOUT SYSTEM

Ernest C. Karras, Chicago, and Lester R. Cain, Oaklawn, both of Ill., assignors to Comtech Corporation, Broadview, Ill.

Filed Oct. 27, 1969, Ser. No. 869,455
Int. Cl. H04m 15/18
U.S. Cl. 179—7.1 TP 5 Claims

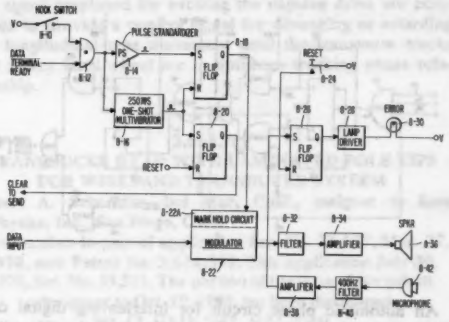


A small, portable, dialed number printout unit is provided which can be used in central offices or at the subscriber's premises to provide a print of the called number in numerical form on a record medium as soon as this number is dialed by the calling party. Printout of the called number will automatically occur approximately 20 seconds after the last digit is dialed or upon hang-up, whichever is sooner. Facilities are also provided for selectively printing only those dialed numbers which have a predetermined number of digits and rejecting all dialed numbers having digits greater or less than said predetermined number. A false digit appearing on the line before dialing is started may be automatically absorbed and not printed. Facilities are also provided for automatically advancing the record medium a predetermined amount after each printing operation such that the printed called number is immediately visible to an attendant.

3,663,757
ELECTROACOUSTIC CONVERTER

Carl R. Cassidy, Hatboro, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 12, 1969, Ser. No. 875,697
Int. Cl. H04m 11/06
U.S. Cl. 179—2 DP 7 Claims

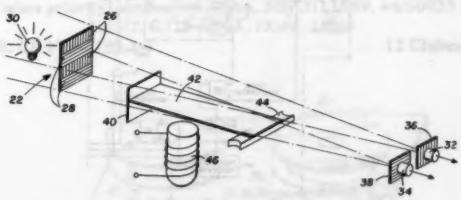


This converter enables the transmission of digital data over a standard telephone by means of a pair of audible tones. It can be used to couple a terminal machine such as a teletypewriter, with a computer at a distant location, using ordinary dial-up voice-grade telephone lines. It can be considered to be a coupler, a converter or an adapter. Functionally, it receives electrical pulses at its input, and converts them to audible tones at its output. There is, of course, no wiring connection required between the converter and the telephone itself.

3,663,758
SPEECH PATTERN RECOGNITION SYSTEM

Virgil Erbert, Albuquerque, N. Mex., assignor to Teaching Complements, Incorporated

Filed Mar. 24, 1970, Ser. No. 22,155
Int. Cl. G10l 1/00
U.S. Cl. 179—1 SA 27 Claims



A speech pattern recognition system includes sets of radiation modulation members that transmit radiation of two different types and two radiation responsive members each for receiving one of the radiation types. A shutter is supported adjacent each set on a reed having a resonant frequency matched to the frequency of a particular segment of a spoken syllable or word. In the use of the system, the vibrational amplitudes of the shutters control the amount of each type of radiation that is received by the radiation responsive members. When the difference between the outputs of the radiation responsive members is at a maximum, the system produces an output indicative of the correct enunciation of the word or syllable.

3,663,759

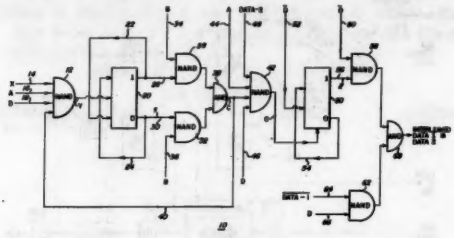
AUTOMATIC PHASE CIRCUIT

Joseph F. Havel, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of application Ser. No. 762,109, Oct. 2, 1967, now abandoned. This application May 21, 1970, Ser. No. 41,663

Int. Cl. H04j 3/06

U.S. Cl. 179—15 BA 13 Claims



An automatic phase circuit for interleaving digital data trains, one train having an arbitrary phase relationship with a clock signal, which circuit employs a gating technique thereby eliminating the need for any delay lines.

3,663,760

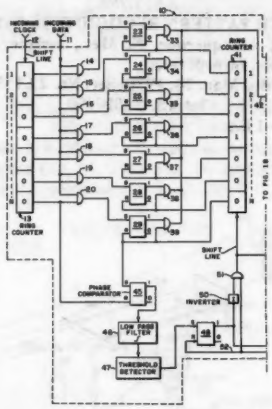
METHOD AND APPARATUS FOR TIME DIVISION MULTIPLEX TRANSMISSION OF BINARY DATA

Russell G. De Witt, Berkeley Heights, N.J., assignor to The Western Union Telegraph Company, New York, N.Y.

Filed July 8, 1970, Ser. No. 53,082

Int. Cl. H04j 3/06

U.S. Cl. 179—15 BA 10 Claims



A method and apparatus for transmitting a binary data stream over a channel of a multiple channel time division multiplex transmission system wherein the channel includes N consecutively occurring transmission digit slots. Method and apparatus elements are provided for employing a pulse stuffing technique wherein the $(N-1)$th transmission digit slot is periodically stuffed high and the Nth digit slot is transmitted in the low state on each occurrence of the stuffing to signal the receiving facility of the stuffing. The $(N-1)$th slot when not stuffed and the remainder of the N digit slots are employed to transmit the binary data. The stuffing and signalling are performed sufficiently frequent to provide a long term average digit rate of the digit slots transmitting the data equal to the digit rate of the binary data stream.

3,663,761

TIME DIVISION MULTIPLEX TRANSMISSION SYSTEM

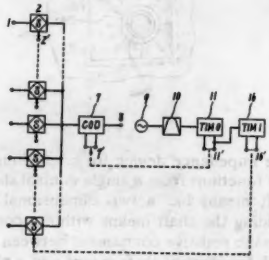
Denroku Kumagai, and Yutaka Kurahashi, both of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Continuation-in-part of application Ser. No. 470,138, July 10, 1965, now abandoned. This application Aug. 5, 1969, Ser. No. 852,528

Claims priority, application Japan, July 10, 1964, 39/39641

Int. Cl. H04j 3/00

U.S. Cl. 179—15 AT 7 Claims



A multiplex transmission device includes pulse timing generating apparatus for generating channel sampling pulses and group sampling pulses whereby the time slots of the lowest frequency group at the input are successively divided to provide higher ordered groups of information at higher frequencies. A repeater station for combining and dropping groups or portions of groups of PCM signals in a multi-channel time division multiplex transmission system provides circuitry for generating timing control signals from groups of the multiplex signals to delay and/or inhibit select portions of selected information groups to either combine or drop selected information therein from the transmitted signal groups. The control circuitry utilizes either feed forward or feedback techniques.

3,663,762

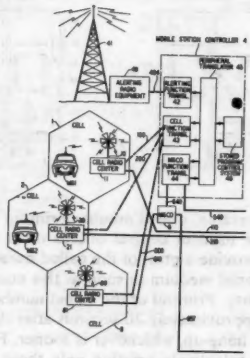
MOBILE COMMUNICATION SYSTEM

Amos Edward Joel, Jr., South Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1970, Ser. No. 99,926

Int. Cl. H04q 7/00

U.S. Cl. 179—41 A 20 Claims



A high capacity cellular mobile communication system arranged to establish and maintain continuity of communication paths to mobile stations passing from the coverage of one radio transmitter into the coverage of another radio transmitter. A control center determines mobile station locations and enables a switching center to control dual access trunk circuitry to transfer an existing mobile station commu-

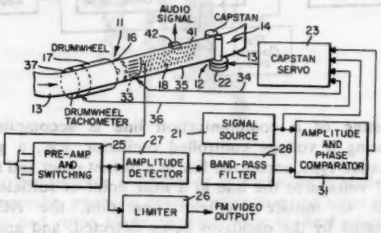
nication path from a formerly occupied cell to a new cell location. The switching center subsequently enables the dual access trunk to release the call connection to the formerly occupied cell.

3,663,763

AUTOMATIC TRACKING METHOD AND APPARATUS FOR ROTARY SCAN TAPE TRANSPORT

Allen J. Trost, Santa Clara, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 6, 1970, Ser. No. 25,911
Int. Cl. G11b 15/46, 21/04
U.S. Cl. 179—100.2 T 3 Claims



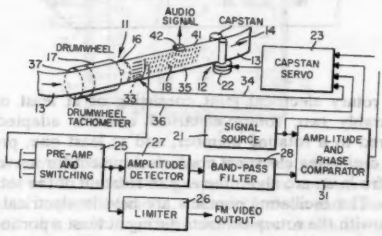
In order to provide automatic tracking during playback operation of a transverse scan tape transport, a low amplitude and low frequency signal is applied to the capstan drive in addition to the nominal playback drive signal such that the prerecorded transverse information tracks vacillate about an on-center tracking phase relationship with the rotary record/reproduce head wheel. The high frequency playback information signal from the rotary head wheel is thereby amplitude modulated in accordance with the varying tracking registration between the head wheel and transverse tracks. The amplitude modulation of the playback information signal is thereupon detected, and the frequency, phase and amplitude relationships between this detected signal and the signal employed for exciting the capstan drive are compared to provide a control signal for advancing or retarding the longitudinal tape movement until the transverse tracks and rotary head wheel are in optimum tracking phase relationship.

3,663,764

AUTOMATIC TRACKING CIRCUIT FOR TRANSVERSE SCAN MAGNETIC TAPE TRANSPORT

Allen J. Trost, Santa Clara, and Reginald W. Oldershaw, San Jose, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Apr. 6, 1970, Ser. No. 25,910
Int. Cl. G11b 15/46, 21/04, 21/10
U.S. Cl. 179—100.2 T 1 Claim



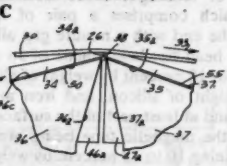
In order to provide automatic tracking during playback operation of a transverse scan tape transport, a low amplitude and low frequency signal is applied to the capstan drive in addition to the nominal playback drive signal such that the prerecorded transverse information tracks vacillate about an on-center tracking phase relationship with the rotary record/reproduce head wheel. The high frequency playback information signal from the rotary head wheel is thereby amplitude modulated in accordance with the varying tracking registration between the head wheel and transverse tracks. The amplitude modulation of the playback information signal is thereupon detected, and the frequency, phase and amplitude relationships between this detected signal and the signal employed for exciting the capstan drive are compared to provide a control signal for advancing or retarding the longitudinal tape movement until the transverse tracks and rotary head wheel are in optimum tracking phase relationship.

3,663,765

TRANSDUCER HEAD WITH LAMINATED POLE TIPS FOR WIDEBAND TRANSDUCER SYSTEM

Robert A. Schneider, Del Mar, Calif., assignor to Spin Physics, Inc., San Diego, Calif.

Continuation-in-part of application Ser. No. 23,157, Mar. 27, 1970, now Patent No. 3,614,339. This application July 30, 1970, Ser. No. 59,511. The portion of the term of the patent subsequent to Oct. 19, 1988, has been disclaimed.
Int. Cl. G11b 5/42, 5/22, 5/40
U.S. Cl. 179—100.2 C 9 Claims



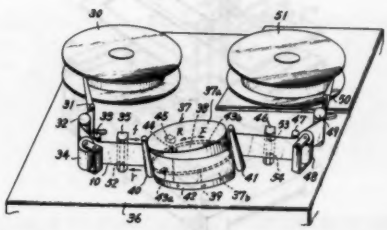
A composite magnetic transducer head having laminated pole tips preferably formed of a special hot-pressed sintered iron-silicon-aluminum material with an electrical insulating layer isolating the pole tips from the ferrite core and having a thickness producing optimum high frequency response and signal to noise ratio.

3,663,766

CONTINUOUS SCANNING MAGNETIC RECORDING AND/OR REPRODUCING SYSTEM AND APPARATUS

Kunio Goto, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed July 29, 1970, Ser. No. 59,311
Claims priority, application Japan, July 31, 1969, 44/60023
Int. Cl. G11b 15/06, 15/44, 21/06
U.S. Cl. 179—100.2 T 12 Claims



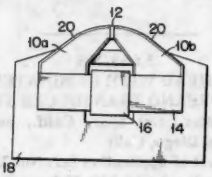
In a continuous scanning system, a rotary magnetic head scans a magnetic tape with oblique tracks from a beginning end to a terminating end of the tape. When the magnetic head has reached the end of the tape, the rotating direction of the magnetic head and the travelling direction of the magnetic tape are automatically reversed. The magnetic head again continuously and endlessly scans the tape. The magnetic head thus records or reproduces signals on the magnetic tape, upon the above scanning.

3,663,767

MAGNETIC HEAD

Kazumi Shimotori, Kawasaki-shi; Michiyasu Takagi, Yokohama-shi; Yoshihisa Kawamura, Chigaski-shi, and Shoichi Kiyooka, Zushi-shi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Nov. 12, 1969, Ser. No. 875,937
Claims priority, application Japan, Nov. 16, 1968, 43/83666; 43/83667
Int. Cl. G11b 5/00
U.S. Cl. 179—100.2 C 5 Claims



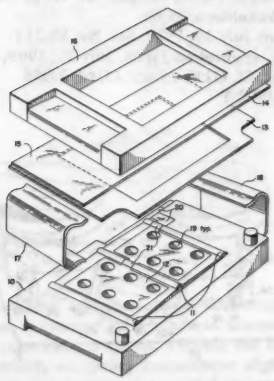
A magnetic head used in recording information in a magnetic tape or reading out the information already stored therein, which comprises a pair of head tips oppositely formed at the end with a minute gap allowed therebetween, each of the head tips being made of an alloy essentially consisting of 3 to 18 percent by weight of aluminum, 0 to 12 percent by weight of silicon, and iron and impurities as the remainder and at least part of the surface area of the head tip contacting the magnetic tape being provided with a nitride layer containing 10 to 12 percent by weight of nitrogen.

3,663,768

ELECTRET TRANSDUCER

Henning Schmidt Madsen, Hillerod, Denmark, and Cornelis Wilfred Reedyk, Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Jan. 15, 1971, Ser. No. 106,776
Int. Cl. H04r 19/00
U.S. Cl. 179—111 E 7 Claims



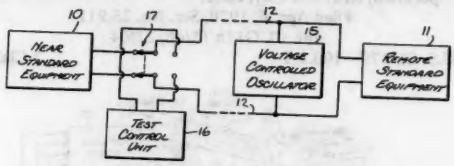
An electret transducer comprising a metallized diaphragm tensioned in juxtaposition with a metallic backplate in which the width to height of the air gap between the two is selected so that the sensitivity remains substantially constant over the life of the transducer. The backplate contains ridges over which the diaphram is tensioned.

3,663,769

METHOD AND APPARATUS FOR TESTING A COMMUNICATION LINE

John T. Boatwright, Hopkinton, and Donald L. Knight, Concord, both of N.H., assignors to Northeast Electronics Corporation, Concord, N.H.

Filed July 25, 1969, Ser. No. 844,965
Int. Cl. H04b 3/46
U.S. Cl. 179—175.3 15 Claims



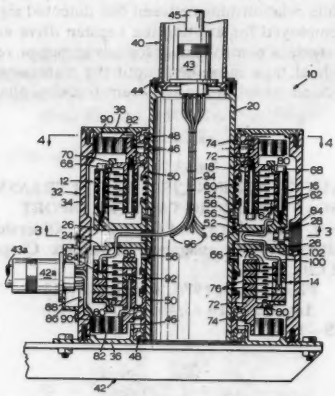
Testing of a communication line is accomplished by disposing a voltage controlled oscillator, e.g., a gas tube relaxation type, across the line at a distant point and applying a DC voltage to the line at a near point of sufficient magnitude to initiate oscillator operation, the AC signal generated by the oscillator being detected, and analyzed if desired, at the near point.

3,663,770

ELECTRICAL ROTARY JOINT

Ernest Groskopfs, Caledon East, Ontario, Canada, assignor to Spar Aerospace Products Limited, Toronto International Airport, Ontario, Canada

Filed Dec. 1, 1970, Ser. No. 93,938
Int. Cl. H01h 19/54, 27/76
U.S. Cl. 200—11 R 20 Claims

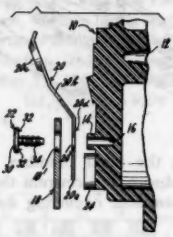


A rotary electrical joint consisting of at least one, and preferably two, rotary electrical contacts adapted to be secured to a rotating member, and at least one, preferably two, oscillating electrical contacts mounted for movement to and fro in an arc about the axis of rotation of the rotary contacts. The oscillating contacts are held in electrical engagement with the rotary contacts during at least a portion of one revolution of the rotary contacts. Circuit breaker means is provided to cyclically disengage the contacts at predetermined intervals during the rotation of the rotary contact and return drive means is provided to drive the oscillating contact in the opposite direction to the rotation of the rotary contact when the contacts are disengaged.

3,663,771
DISTRIBUTOR ROTOR WITH IMPROVED CONTACT SECURING MEANS

John Macyczko, and Endy China, both of Union Springs, N.Y., assignors to Gulf & Western Industries, Inc., New York, N.Y.

Filed Jan. 12, 1971, Ser. No. 105,820
Int. Cl. H01h *1/50, 11/06*
U.S. Cl. 200—19 DR 4 Claims

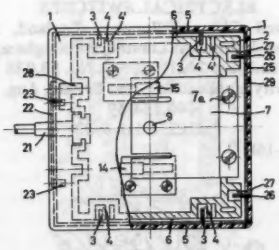


A distributor rotor is disclosed as including a blade and spring assembly enabling precise adjustment of rotor sweep diameter and rotor blade position prior to final assembly. The blade defines an elongated adjustment opening and the rotor includes a molded rotor body defining an upstanding boss. The assembly further includes a spring for assembly between the blade and the rotor body, the spring defining a boss opening for encircling the boss and a downwardly directed tooth for fixing the position of the spring when embedded into the rotor body. The elongated adjustment opening defined by the blade also fits over the boss so that the insertion of a drive screw into a central opening defined by the boss fixes the assembly. The assembly is accomplished on automatic or semi-automatic assembly equipment.

3,663,772
FOOT CONTROL FOR SWITCHING OF AN ELECTRIC DRIVE

Ulrich Grabel, and Peter Michaelis, both of Nurnberg, Germany, assignors to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt IHA, Max Grundig, Fuerth/Bay, Germany

Filed Aug. 11, 1970, Ser. No. 62,973
Claims priority, application Germany, Aug. 21, 1969, P 19 42 495.4
Int. Cl. H01h *3/14*
U.S. Cl. 200—86.5 11 Claims

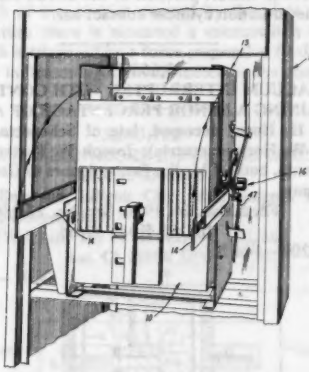


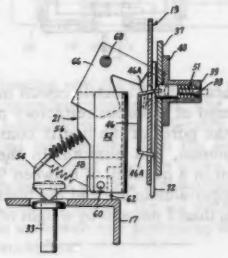
A foot control particularly for a dictating apparatus. The electric drive of the dictating apparatus is to be switched between an inoperative mode, a forward mode and a reverse mode and the switching between these modes is to be sequential. A housing includes an upwardly open lower shell section and a superimposed downwardly open shell section having two spaced marginal portions. The sections are connected with bayonet-type closures permitting the upper section to move upwardly and downwardly with reference to the lower section. A leaf spring is located in the housing and has a first end portion fixed to the lower shell section and urges the upward shell section upwardly with its remote second end portion. A spherical element is interposed between the second end portion and the upper shell sections so that the latter rocks about the spherical element with reference to the lower shell section when downward pressure is applied on one of two spaced marginal portions of the upper shell section. Pressure on one of these marginal portions causes the upper shell section to be rocked downwardly to a first position in which the drive is switched from inoperative to forward mode, and pressure on the other marginal portion causes the upper shell section to be rocked downwardly to a second position in which the drive is switched sequentially past the forward mode to a reverse mode.

3,663,773
SWITCHGEAR DRAW-OUT APPARATUS WITH CLUTCH INTERLOCK

David B. Powell, Bristol, Conn., assignor to General Electric Company

Continuation of application Ser. No. 17,021, Mar. 9, 1970, now abandoned, and a continuation of 772,305, Oct. 31, 1968, now abandoned. This application Nov. 9, 1970, Ser. No. 88,184
Int. Cl. H01h *33/48*
U.S. Cl. 200—50 AA 2 Claims





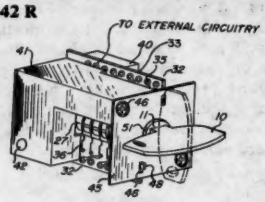
An assembly comprising an outer and an inner frame, the inner frame riding on rail portions and being cammed by a mechanism operated by a side mounted handle. Mating electrical contacts are provided on the inner and outer frames. Mechanical interlocks are provided to guard against breaking or making the load current path at the mating connectors. The interlocks disconnect the side mounted handle from the camming mechanism if electrical contacts in an electrical switching device carried by the inner frame are in the closed position.

3,663,774

KEY OPERATED SWITCH

Alvin Feder, Skokie, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 4, 1971, Ser. No. 121,095
Int. Cl. H01h 27/00
U.S. Cl. 200—42 R 13 Claims



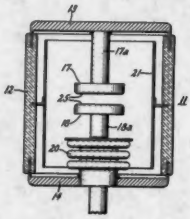
A key operated switch is provided having a locking portion operative in response to insertion of a key to unlock and rotate. A nonconductive actuation cylinder is coupled to and rotates with the lock. This actuation cylinder has a conductive contact bar mounted therein, and has a key slot through the center. Circuit means are provided for connecting the actuation cylinder contact bar and external circuitry when the actuation cylinder is rotated. The key is provided having a first portion for insertion into the lock means for unlocking and rotating the same, and a second portion for insertion through the actuation cylinder key slot. The second portion is operative to inhibit portions of the circuit means from engaging the actuation cylinder contact bar.

3,663,775

VACUUM INTERRUPTER WITH CONTACTS CONTAINING A MINOR PERCENTAGE OF ALUMINUM

Fordyce H. Horn, deceased, late of Schenectady, N.Y. (by Helen W. Horn, executrix); Joseph W. Porter, and Joseph L. Talento, both of Media, Pa., assignors to General Electric Company

Filed Mar. 24, 1970, Ser. No. 22,250
Int. Cl. H01h 33/66
U.S. Cl. 200—144 B 11 Claims



Discloses a vacuum-type electric circuit interrupter having its contacts formed of a porous refractory metal matrix and an alloy filling the pores of the matrix consisting essentially of copper, aluminum, and bismuth. In the alloy, the aluminum is present in a quantity of between 9 and 15 percent by weight of copper-aluminum, and the bismuth is present in a quantity of less than 5 percent by weight of the total alloy.

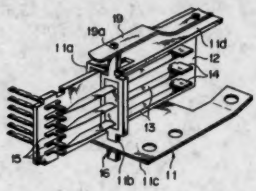
3,663,776

VIBRATOR ABSORBING MEANS FOR AN ELECTRICAL SWITCH

Shuji Muraki, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seiza Kabushiki Kaisha, Shizuoka-ken, Japan

Filed May 14, 1971, Ser. No. 143,473
Claims priority, application Japan, May 19, 1970, 45/48426
Int. Cl. H01h 1/50
U.S. Cl. 200—166 H 3 Claims

An electrical switch having vibration absorbing means to eliminate mechanical and electrical click noises raised therein during a switching action, which comprises an actuating member consisting of an inner member of elastic material supporting one or more movable contact members by direct contact therewith, and an outer member of rigid material



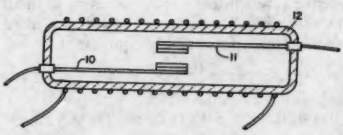
securely supporting the inner member. The elastic inner member serves to absorb and restrain the vibrations of the movable contact members, occurring during the switching action.

3,663,777

REED SWITCH

Anthony Steinmetz, and Douwe Mindert de Boer, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 21, 1970, Ser. No. 66,008
Claims priority, application Netherlands, Aug. 29, 1969, 691314; June 10, 1970, 7008388
Int. Cl. H01h 1/66
U.S. Cl. 200—166 C 8 Claims



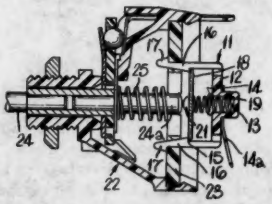
A switching device such as a reed switch having moving contacts whose outer contacting surface consists of an outer layer of metal such as ruthenium or rhodium having thickness of from 0.1 to 5.0 μm with an interrupted or non-interrupted underlayer of at least 1 percent by volume of non-metal.

3,663,778

ELECTRICAL SWITCHES

Robert Leonard Gleeson, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 24, 1970, Ser. No. 58,038
Claims priority, application Great Britain, Aug. 12, 1969, 40,184/69
Int. Cl. H01h 9/02
U.S. Cl. 200—168 C 5 Claims



An electrical switch includes a body housing a pair of fixed contacts. A movable contact is movable into and out of en-

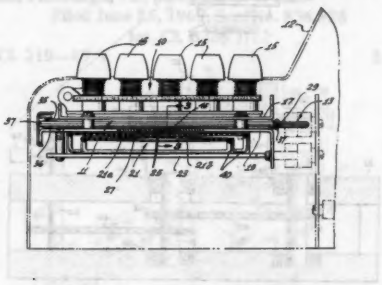
gagement with the fixed contacts, and is urged out of engagement with the fixed contacts by a spring. The body of the switches provided with a pair of resilient lugs whereby the switch can be engaged with the casing of a further switch, so that an operating member of the further switch serves also to move the movable contact against the action of said spring.

3,663,779

SEALED ELECTRICAL PACKAGE

Richard K. Gerlach, Rolling Hills Estates, and Meryl E. Miller, Palos Verdes Peninsula, both of Calif., assignors to Datanetics Corporation, Redondo Beach, Calif.

Filed May 12, 1969, Ser. No. 823,785
Int. Cl. H01h 9/04
U.S. Cl. 200—168 G 24 Claims



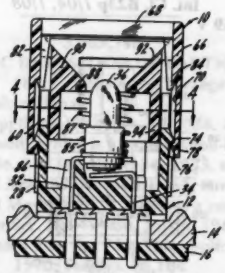
A substantially sealed and pressure compensated electrical package including a limp bladder in fluid communication with a module having electrical switching elements, the bladder being capable of substantially stress free inflation and deflation in response to changes in external environment pressures, without any fluid exchange between the module and the environment, whereby protection against toxic atmospheres is provided and inadvertent switching due to environmental pressure changes is avoided.

3,663,780

SWITCH IN A BUTTON

Bernard J. Golbeck, Crystal Lake, Ill., assignor to Oak Electro/Nectics Corp., Crystal Lake, Ill.

Filed June 8, 1970, Ser. No. 44,310
Int. Cl. H01h 9/16
U.S. Cl. 200—167 8 Claims



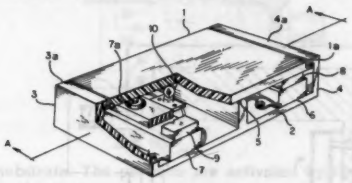
A button switch which includes a base and a button telescopically mounted on the base. The base and button are hollow and there is a spring positioned within the hollow interiors to urge the button outwardly away from the base. An interlock between the button and the base limits movement of the button. There are electrical terminals mounted on the base and movable electrical contact shoes mounted on the button and positioned for sliding contact with the terminals.

3,663,781

ELECTRICAL SWITCH HAVING A FLEXIBLE ONE-PIECE ACTUATOR

Robert C. Zimmerman, Manlius, N.Y., and James R. Lindsay, Fullerton, Calif., assignors to SCM Corporation, New York, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,858
Int. Cl. H01h 3/02
U.S. Cl. 200—172 R 5 Claims



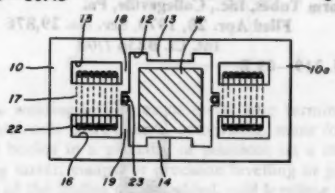
In an embodiment of an electrical switch, a rectangular translucent elastic plate having projections which extend from two opposing edges is coupled to a supporting structure. The supporting structure includes a rectangular base, two opposing side walls having projections over the base, and a fulcrum projecting from the base which is parallel to and equidistant from both walls. The plate rests on the fulcrum and the side wall projections overlap the plate projections thereby preventing clockwise rotation of one end of the plate and counterclockwise rotation of the opposing end of the plate. In each of the cavities created by the plate and supporting structure there is mounted a microswitch having a plunger which is triggered by a force responsive flexing of the plate and an indicator light which indicates the state of the microswitch.

3,663,782

LAMINATED IRON CORE INDUCTION CORNER-HEATING UNIT

William A. Emerson, Ellicott City, Md., assignor to United States Steel Corporation

Filed June 10, 1971, Ser. No. 151,667
Int. Cl. H05b 5/00
U.S. Cl. 219—10.43 6 Claims



An induction heating unit for the corners of an elongated workpiece of rectangular cross section. The unit has a core formed of iron laminations, and preferably has occasional copper laminations interspersed with the iron laminations. Each lamination has a pair of windows which define a central leg and webs between the window and workpiece. A winding of copper tubing extends around the leg within the windows. The webs form an unbroken wall protecting the winding from exposure to the workpiece.

3,663,783

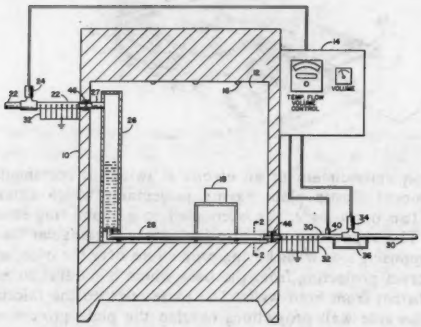
SAFETY LOAD AND TEMPERATURE CONTROL SYSTEM FOR MICROWAVE OVENS

Elbert L. McKague, Jr., Fort Worth, and Walter C. Cooper, Jr., Hurst, both of Tex., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 7, 1970, Ser. No. 95,783
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 13 Claims

A safety load and temperature control system for microwave ovens wherein a variable volume of water is

passed through the oven for controlling the amount of energy received by a work piece therein. Microwave energy from magnetron tubes is introduced into the oven chamber for processing a work piece. The variable supply of water within the chamber is increased for small parts being cured and decreased for large parts being cured. The water is passed through a dielectrically transparent vessel within the chamber and is heated by the microwave energy proportional to the heated work piece or part. The temperature of the



water leaving the chamber is indicative of the rate of change of the work piece temperature. A temperature controller has upper and lower limits that increase or decrease the water in the chamber and passing therethrough to maintain the work piece heating rate within a desired range. The variable supply of water also serves as a dummy load to absorb excessive radiant energy, preventing destructive feedback to the magnetron tubes. Microwave filters at water inlet and outlet ports keep the high frequency energy within the chamber.

3,663,784

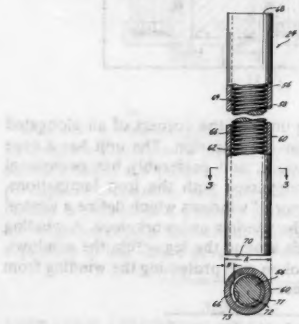
NON-TREPANNING NON-ROTARY ELECTRODE FOR ELECTRO-EROSION OF METALS

Albert Bruce Mainwaring, Phoenixville, Pa., assignor to Uniform Tubes, Inc., Collegeville, Pa.

Filed Apr. 20, 1970, Ser. No. 29,876

Int. Cl. B23p *1/08*

U.S. Cl. 219—69 E **11 Claims**



A non-rotary electrode for forming holes in metal workpieces by electro-erosion in which the through bore of passage for the dielectric fluid is spiral and generates a substantially crescent-shaped area when a cross-section is taken through the entire electrode, the maximum transverse depth of the crescent-shaped area extending up to the central axis of the electrode as a maximum so that substantially no build-up of a central plug in the workpiece occurs due to trepanning as the active end of the electrode is consumed in the process. The invention also includes electro-erosion apparatus and an electro-erosion method using the non-trepanning, non-rotary electrode.

3,663,785

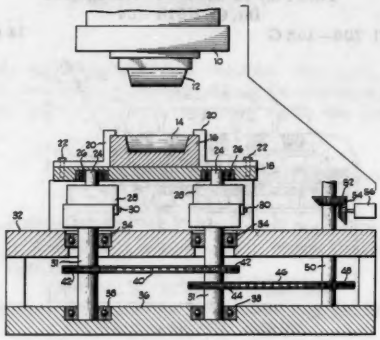
METHOD OF EROSIVELY SHAPING A MASTER DIE

Elmer P. Hausermann, 4 N 224 Hawthorne, Bensenville, Ill.

Continuation-in-part of application Ser. No. 21,559, Mar. 23, 1970, now abandoned. This application Dec. 14, 1970, Ser. No. 97,993

Int. Cl. B23p *1/12*

U.S. Cl. 219—69 M **10 Claims**



A method of shaping electrodes for use in electrical discharge machining processes comprising the steps of preparing an oversize cavity in a master die member on an apparatus that provides oscillatory rotary motion to either a die member or a model electrode member used to form the cavity of the die member, providing an abrasive surface on the cavity of master die member and utilizing in conjunction with the master die an apparatus, similar to that used to form the cavity in the master die member, to abrade and form an electrode workpiece member to an electrical discharge machining electrode of the size of the model electrode member.

3,663,786

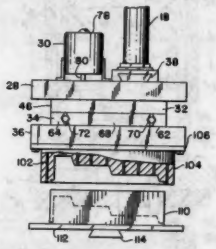
APPARATUS FOR ELECTROEROSIVE MACHINING OF METAL

Thomas J. O'Connor, 100 Morgan Road, Ann Arbor, Mich.

Filed Apr. 27, 1966, Ser. No. 545,652

Int. Cl. B23p *1/04*, *1/08*

U.S. Cl. 219—69 V **6 Claims**



A tool for universal movement of a cutting member in a plane perpendicular to a predetermined direction of movement of the cutting member is disclosed. The tool is disclosed in conjunction with an abrasive electrode form having a shape which is the reverse image of an electrode to be produced thereby and which is constructed of abrasive parti-

cles held in a plastic matrix whereby an electrode may be abraded from electrode material on movement of the electrode form toward the electrode material in the predetermined direction. The structure for universally moving the electrode form cutting member in a plane perpendicular to the direction of movement of the cutting member includes relatively eccentric, and rotatable members positioned in two slides slidably mounted perpendicularly to each other.

3,663,787

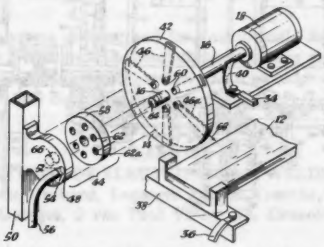
ELECTRICALLY-ASSISTED COMBUSTION CUTTING APPARATUS

Walter T. Haswell, III; Terry O. Hockenberry, and Everard M. Williams, all of Pittsburgh, Pa., assignors to Walter T. Haswell, III; Terry O. Hockenberry and Everard M. Williams, Pittsburgh, Pa., part interest to each

Filed June 25, 1969, Ser. No. 836,528

Int. Cl. B23p *1/12*

U.S. Cl. 219—69 V **3 Claims**



Cutting apparatus comprises cutting electrode, means for moving the electrode, and means for supporting a workpiece adjacent a cutting surface of the electrode such that the cutting surface can be moved continuously in a direction substantially parallel to the face of the cut to be made in the workpiece. Means provided for translating one of the workpiece and the electrode toward and away from the other. A source of electric potential and a pulse generating circuit are connected to the electrode and workpiece to induce repetitive discharges across a gap between the electrode and workpiece. The apparatus further includes means for interjecting a combustion supporting medium into the gap whereby combustion of workpiece at the cutting face is initiated by the gap discharges.

3,663,788

KINETIC DEPOSITION OF PARTICLES

Kiyoshi Inoue, 182, 3-chome, Tamagawayoga-Machi, Setagaya-ku, Tokyo, Japan

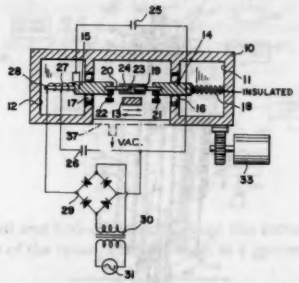
Continuation of application Ser. No. 574,056, Aug. 22, 1966, now abandoned , which is a continuation-in-part of application Ser. No. 311,061, Sept. 24, 1963, now Patent No. 3,267,710, and 508,487, Nov. 18, 1965, now Patent No. 3,512,384, dated May 19, 1970, which is a continuation-in-part of application Ser. No. 41,080, July 6, 1960, now Patent No. 3,232,085, dated Feb. 1, 1966. This application July 29, 1970, Ser. No. 64,104

Claims priority, application Japan, June 11, 1966, 41/37635; 41/45288; July 11, 1966, 41/45289; Aug. 19, 1966, 41/54709; 41/54710

Int. Cl. B23k *9/04*

U.S. Cl. 219—76 **25 Claims**

A method of coating a substrate in which a mass of particulate material is formed in situ or disposed between a pair of electrodes which produce a spark discharge to create a shock wave carrying the particles onto and bonding them to



the substrate. The particles are activated by their presence within the discharge.

3,663,789

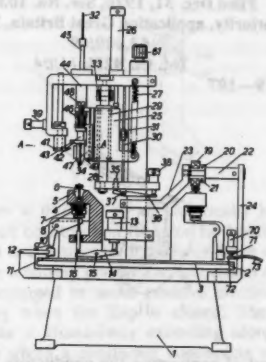
WELDING APPARATUS OF WIRE TERMINALS ON ELECTRONIC COMPONENTS

Giuseppe Camardella, Via Azio Biondi-1, 20154 Milan, Italy

Filed Mar. 15, 1971, Ser. No. 124,200

Int. Cl. B23k *9/12*

U.S. Cl. 219—79 **20 Claims**



Automatic welding apparatus of metal wire terminals on bodies of electronic components, comprising: mans for supporting said bodies in a plurality of positions on a step-by-step indexing turret; means for precision levelling or gauging the surfaces of the bodies to be welded, said levelling means operating at a fixed station with respect to the indexing turret; and means operating in a working station for feeding a preselected length of wire to a first operating position, for cutting said length of wire, for further feeding said length of wire up to contacting one of said bodies, and for welding the wire on the body by means of an electric discharge through the point of contact, the electric current being fed directly through the length of wire, on one side, and respectively through the supporting means of the bodies of the other side.

3,663,790

ELECTRICAL TRANSFORMER APPARATUS

Bernard Humblot, 6 Allee de la Bretonniere, 78 Chambourcy, France

Filed May 4, 1970, Ser. No. 34,348

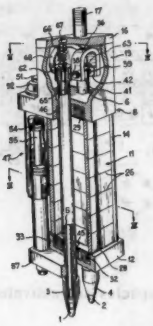
Claims priority, application France, May 22, 1969, 6916670

Int. Cl. B23k *9/28*

U.S. Cl. 219—86 **11 Claims**

Electrical transformer apparatus particularly well suited for use in resistance welding equipment and employing two

movable welding electrodes which together with the work piece form a single loop secondary winding in a magnetic



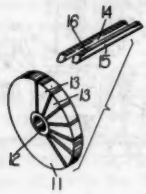
transformer. The electrodes are translated longitudinally with respect to the transformer and with respect to each other by means of a fluid operated ram.

3,663,791

DYNAMO ELECTRIC MACHINES

Brian Robert Allen, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 31, 1970, Ser. No. 103,124
Claims priority, application Great Britain, Dec. 31, 1969, 63,409/69
Int. Cl. B23k *11/04*
U.S. Cl. 219—107 **6 Claims**



A method of connecting the conductors of the rotor of a dynamo electric machine to the segments of the commutator of the machine includes, starting with a pair of rotor winding conductors which are physically and electrically interconnected adjacent the end of a first conductor of the pair of conductors, with the end of said first conductor projecting beyond the end of the second conductor, engaging the projecting end of the first conductor with the surface of a portion of a segment of a commutator. The commutator is formed with a shoulder which defines one end of the surface thereof, and the projecting portion of the rotor conductor is engaged with said portion of the segment at least up to said shoulder. The conductor is then resistance welded to the segment, so that the first and second conductors are electrically connected to the segment.

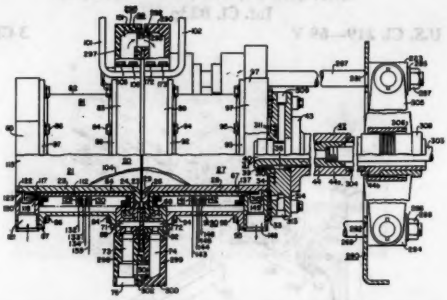
3,663,792

APPARATUS AND METHOD OF INCREASING ARC VOLTAGE AND GAS ENTHALPY IN A SELF-STABILIZING ARC HEATER

Maurice G. Fey, Turtle Creek, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 2, 1970, Ser. No. 15,597
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 P **7 Claims**

The method includes admitting gas to be heated at a high velocity into an arc chamber through a narrow gap between spaced electrodes while maintaining across the electrodes a system or backup voltage sufficient at all times to cause electrical breakdown in the narrow gap between electrodes, while producing in the arc chamber a magnetic field having a preselected configuration to produce a beneficial effect or effects on the arc. The arc is periodically elongated by the high velocity gas until it attains such a length that the voltage required to sustain the arc exceeds the breakdown voltage of the gap whereupon the arc returns to the gap momentarily only to be blown out and elongated again. Gas is brought to the vicinity of the outside of the gap through a plurality of tangentially extending slots at spaced intervals around the entire periphery of the gap, whence it passes through the gap, the gas passing through the gap having a radial component and a tangential component. The high tangential flow component provides sufficiently large gas velocity to blow the arc



from the electrode gap at a greatly reduced mass flow rate which may be of the order of one-fourth the flow rate which would be required if gas were admitted solely in a radial direction through the gap. The resulting decrease in the volume of gas to be heated results in an increased enthalpy imparted to the heated gas which may be of the order of five times that which can be obtained by purely radial gas admission. A higher arc voltage, results in a greatly improved power factor, and resulting decreased arc current results in an improvement in electrode lifetimes. Centrifugal effects in the arc chamber together with the influence of the magnetic field on the arc establish conditions wherein the arc column virtually follows the center line of the heater.

Apparatus is provided for bringing gas to the gap to produce the aforementioned tangential flow coponent, and generate the magnetic field.

3,663,793

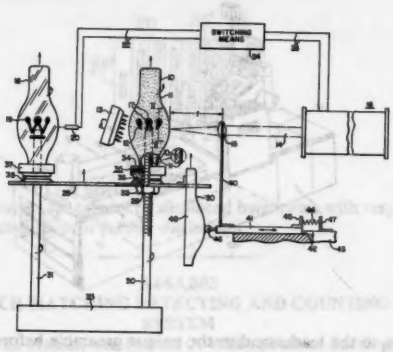
METHOD OF DECORATING A GLAZED ARTICLE UTILIZING A BEAM OF CORPUSCULAR ENERGY

James Petro, Little Falls, and Clair M. Rively, Old Bridge, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 30, 1971, Ser. No. 129,438
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 LM **8 Claims**

The surface of an article, such as a glass envelope for an electric lamp, is provided with a decorative pattern or indicia by coating the article with a vitreous material that includes a substance (such as lead oxide) that undergoes a permanent change in color when heated under reducing conditions, subjecting the article to a laser beam and a reducing gas flame, and varying the position of the article relative to the beam at a speed and in a manner such that the beam scans the article and thereby melts preselected portions of the vitreous coating and changes the color of such portions. In the case of a vitreous or ceramic article that is susceptible to thermally-induced fracturing, the vitreous coating material is preferably deposited on the article in the form of a frit and the article is

preheated to a temperature which is near or above its strain point, thus fusing the frit in place just before the glazed heated article is exposed to the reducing environment and laser beam.



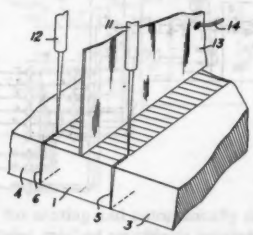
An apparatus and method for concurrently firing a glass frit on an article and color-etching the resulting glazed article with a laser having control means which includes a prototype article are also disclosed.

3,663,794

METHOD OF ELECTRON BEAM WELDING

Maurice de Cachard, Legorget 38, La Tronche, and Jean-Louis Georges, 2 rue Paul Valery 38, Grenoble, both of France

Filed May 4, 1971, Ser. No. 140,211
Claims priority, application France, May 29, 1970, 7019861
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 EM **3 Claims**



Three adjacent metallic blocks comprising two lateral blocks fabricated from a metal which is different from the central block are joined together by forming weld fillets simultaneously along the two joint planes by means of two electron guns which are displaced in parallel motion respectively along each plane.

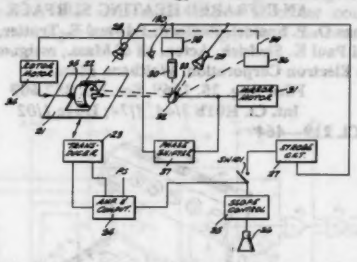
3,663,795

ROTOR BALANCER

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 28, 1968, Ser. No. 770,983
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 **26 Claims**

A method and apparatus for dynamically balancing rotary bodies while rotating at operating speed. A laser beam is deflected in a circular path by a moving or nutating mirror or refracted by a wobbling lens which is made to move in synchronism with the rotation of the rotary element such that the beam constantly impinges upon the locus of imbalance of the element until sufficient energy is absorbed from the laser



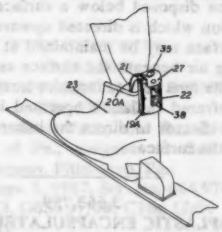
beam to melt and boil-off material from this locus to improve the balance of the rotary element such as a gyroscope rotor.

3,663,796

ELECTRICALLY HEATED BOOT SOCK AND BATTERY SUPPORTING POUCH THEREFOR

Benjamin M. Hines, Greenfield Hill, and Richard L. Johnson, Easton, both of Conn., assignors to Timely Products Corporation, Fairfield, Conn.

Filed Mar. 4, 1970, Ser. No. 16,371
Int. Cl. H05b *1/00*
U.S. Cl. 219—211 **11 Claims**



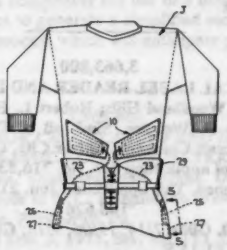
This disclosure is directed to an electrically heated boot sock and a pouch construction therefor for holding the battery. The pouch is constructed of foldable sheet material arranged to define a battery pocket and associated closure flap with contacts arranged to make positive electrical contact with the battery when the flap is closed. The pocket is formed to define a channelway extending along one side thereof through which a conductor connecting with one of the contacts is threaded, and a hooking means is attached to the pocket for detachably connecting the battery pouch to the boot of the wearer.

3,663,797

WEATHERGUARD JERSEY

Roscoe C. Marsh, 3622 Mohegan Drive, San Antonio, Tex.

Filed Aug. 14, 1970, Ser. No. 63,780
Int. Cl. H05b *1/00*
U.S. Cl. 219—211 **2 Claims**



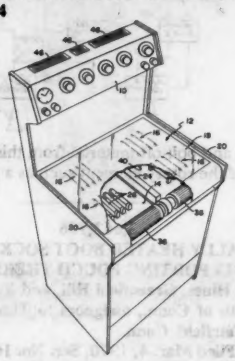
A garment usable as an outer jersey having pockets with heating elements embedded therein for maintaining the hands of the wearer sufficiently warm.

3,663,798

AN INFRARED HEATING SURFACE

Thomas O. P. Speidel, Bedford; Edward E. Trotter, Holliston, and Paul K. Shefsiek, Acton, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Aug. 25, 1969, Ser. No. 852,609
Int. Cl. H01b 3/44, 3/74; H01c 1/02
U.S. Cl. 219—464 14 Claims



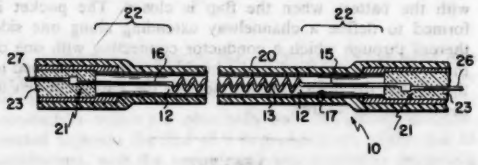
A heating or cooking system which includes an infrared heating source disposed below a surface transparent to infrared radiation which is directed upwardly through the surface. The surface may be maintained at a cool temperature by circulating air beneath the surface as radiation is passed through it. The heat source includes a resistance element for generating infrared radiation operated in an inert environment and a reflector to direct the infrared radiation toward and through the surface.

3,663,799

FLUOROPLASTIC ENCAPSULATED ELECTRICAL RESISTANCE HEATERS

Angus H. McAra, P.O. Box 11127, Pittsburgh, Pa.

Filed Oct. 12, 1970, Ser. No. 79,885
Int. Cl. H05b 3/06
U.S. Cl. 219—523 2 Claims



An electrical resistance immersion heater in which a resistance heater unit including an attached cold extension is encapsulated in a thin fluoroplastic sheathing. The cold extension and heater are capable of being formed in various shapes, the end of which is enclosed by means of a molded terminal ending.

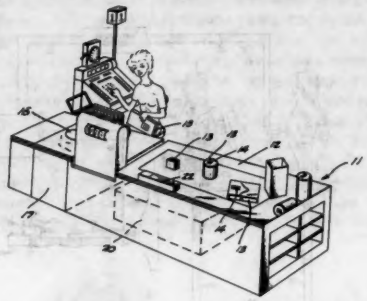
3,663,800

OPTICAL LABEL READER AND DECODER

Jon H. Myer, Woodland Hills; Robert L. Hasslinger, Culver, and Francis P. Webster, Simi, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of application Ser. No. 716,534, Mar. 27, 1968, now abandoned. This application Jan. 21, 1971, Ser. No. 108,626
Int. Cl. G06k 7/14, 19/06, 9/13; G01n 21/30
U.S. Cl. 235—61.11 E 11 Claims

A coded label having a leader, a unique preamble word and data words coded thereon, a system for optically reading the label, including a rotary bar scan optics for continually scanning a label from different incremental angles and generating pulse signals in response to a code thereon, and a decoder coupled to receive the pulse signals which is responsive to the leader and to the unique preamble before decoding the data words of the label, wherein the data will be decoded and displayed only after the label data words have been read twice and compared and the data is complete.

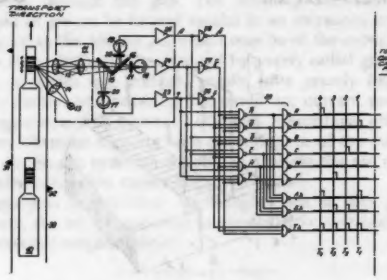


3,663,801

METHOD AND APPARATUS FOR EVALUATING COLOR-CODED INFORMATION

Robert Wahli, Unterengstringen, Switzerland, and Ciba Limited, Basel, Switzerland

Filed July 7, 1969, Ser. No. 839,455
Claims priority, application Switzerland, July 16, 1968, 10605/68
Int. Cl. G06k 7/12
U.S. Cl. 235—61.11 E 7 Claims



Method and apparatus for converting color-coded information into binary coded information and checking the latter against itself and/or a reference code, the original information being coded in the primary colors red, green and blue and the complementary colors cyan, magenta and yellow. By the conversion there is produced a first supplemental signal each time a primary color is detected and a second supplemental signal each time a complementary color is detected. The first and second supplemental signals are utilized to check the binary coded information converted from the color-coded original information.

3,663,802

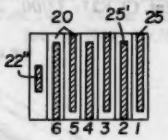
RECORD FOR MACHINE SCANNING

Ernest Wildhaber, 124 Summit Drive, Rochester, N.Y.

Filed Mar. 9, 1970, Ser. No. 17,791
Int. Cl. G06k 7/10, 7/08, 9/02
U.S. Cl. 235—61.12 N 6 Claims

The characters of this record are made up of varying numbers of straight bars placed side by side. The bars are in posi-

tions selected among equally spaced bar positions. They are arranged in a binary code and bars in alternate positions in



the character space may be displaced heightwise with respect to the other bars for further distinction.

3,663,803

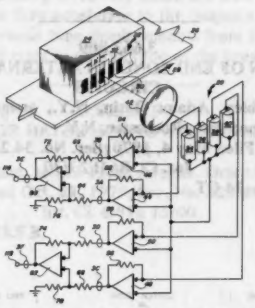
PITCH MATCHING DETECTING AND COUNTING SYSTEM

William L. Mohan, and Samuel P. Willits, both of Barrington, Ill., assignors to Spartanics, Ltd., Palatine, Ill.

Continuation-in-part of application Ser. No. 780,367, Dec. 2, 1968, now Patent No. 3,581,067, dated May 25, 1971. This application June 22, 1970, Ser. No. 47,962

Int. Cl. G06m *1/272*

U.S. Cl. 235—92 V **11 Claims**



An apparatus for sensing and automatically decoding data printed or otherwise marked on objects moving past the apparatus. The coded data is in the form of one or more data channels each comprising a plurality of substantially uniform width stripes of alternating contrast characteristics. Each channel has a sensor array associated with it. Sensing of the coded data present in each channel is accomplished by matching sensor width to that of the coded data stripes and by utilizing sensor arrays that accomplish spatial filtering and signal reinforcement of the data present on each coded channel. Logic circuits sequentially determine the binary or numerical value of elements of coded data as they pass before the apparatus.

3,663,804

REVERSIBLE TERNARY COUNTER

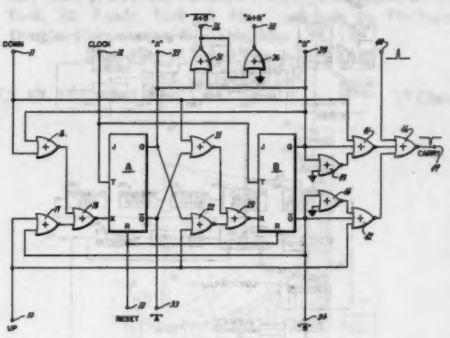
Richard M. Newell, Livermore, Calif., assignor to Zeta Research, Inc., Lafayette, Calif.

Filed Aug. 18, 1970, Ser. No. 64,775

Int. Cl. G06m *3/04*

U.S. Cl. 235—92 LG **11 Claims**

Reversible ternary counter utilizing standard flip-flops and logic gates to provide a low cost counter having an easily decoded output. Means is included for generating a carry pulse whenever the counter overflows in either counting direction and for generating a rounding pulse if the counter is



reset while in its high output state. A plurality of stages incorporating the invention can be cascaded to provide a counter having 3^N output states, where N is the number of stages cascaded.

3,663,805

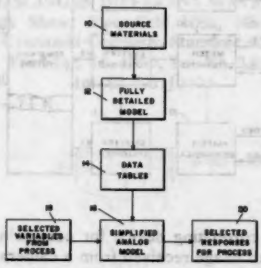
METHOD AND APPARATUS FOR MONITORING PROCESSES

Norman L. Carr, Allison Park, and Donald L. Stahlfeld, Glenshaw, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 1, 1967, Ser. No. 664,976

Int. Cl. G05b *17/00*; C10g *13/00*

U.S. Cl. 235—151.12 **20 Claims**



A method of and apparatus for monitoring a complex chemical process comprising the use of a detailed model and intermediate steps to generate a simplified monitoring model for use with the process which will anticipate process responses.

3,663,806

APPARATUS FOR CALCULATING AND DISPLAYING DYNAMIC COIL PARAMETERS

Volt C. Drankhan, Hamburg, and Frank Di Nicolantonio, Williamsville, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

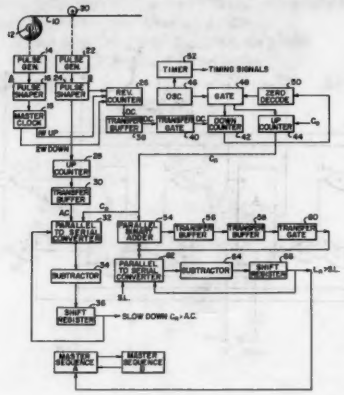
Filed Feb. 3, 1971, Ser. No. 112,228

Int. Cl. G06f *15/46*

U.S. Cl. 235—151.32 **10 Claims**

This disclosure relates to a system for calculating and dis-

playing coil parameters in a dynamic system in which material is being payed from a coil or reel.

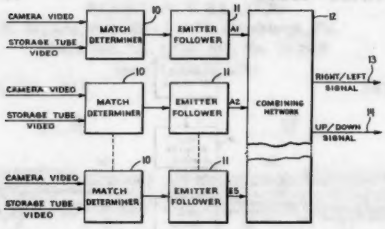


3,663,807

STATISTICAL CORRELATING DEVICE

Klaus J. Hecker, Oberursel, Taunus, Germany, assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 24, 1966, Ser. No. 575,225
Int. Cl. G06f *15/34*
U.S. Cl. 235—181 **1 Claim**



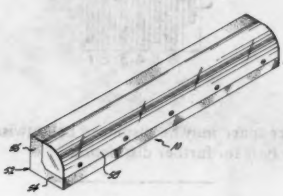
A statistical correlating device for comparing signal elements of a video image received from a camera pickup tube with previously stored signal elements of a video image simultaneously received from a storage tube, for determining the relative spatial deviation between respective signal elements of the two video images. The device employs a plurality of input channels for simultaneously receiving the two video image signals to be spatially compared, each channel including a match determiner comparing circuit for forming the absolute value of the difference between the two input signals, and an emitter follower circuit for providing a necessary low driving impedance. The plurality of channels terminate in a combining network resistor matrix which multiplies the difference signals representative of spatial deviation between the two video images by values representing the spatial location of the source of the stored video image signal in each channel. A pair of differential amplifiers within the combining network combine the signals into left/right and up/down control signals which may be used for positioning the gimbals of the pickup camera in such manner as to cause the spatial deviation between the camera and stored video images to be reduced to zero.

3,663,808

ILLUMINATED SAFETY CURBING

Wilfried Baatz, Bellevue, Wash., assignor to Traffic & Safety Control Systems, Inc., Seattle, Wash.

Filed June 8, 1970, Ser. No. 44,235
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 **10 Claims**



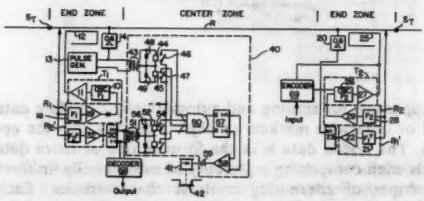
An illuminated safety curbing construction which utilizes a diving bell configuration to protect illuminators from damage by water entering the structure and employing hidden fastening means to secure its translucent cover to its base. Single- or double-faced elongated illuminated curbing sections are adapted to be combined in various configurations with a nose section to form curbings and dividers for different traffic separator situations. Special fastening means provide flexibility and ruggedness to withstand the impact of vehicle wheels.

3,663,809

DETECTION OF END ZONES IN ALTERNATING TRACK CIRCUITS

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed May 4, 1970, Ser. No. 34,237
Int. Cl. B61l *23/30*
U.S. Cl. 246—34 CT **9 Claims**



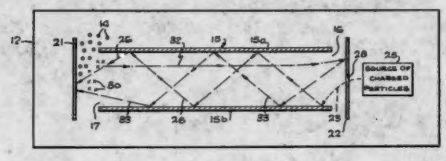
A continuous rail track circuit apparatus having termination shunts at each end detects the presence of a railroad vehicle shunt across the rails and indicates vehicle presence. Shunt means near one end of the track circuit periodically introduces a test shunt across the track, and receiver means coupled to the rails near the other end of the track circuit is sensitive to changes in track circuit parameters occasioned by the test shunt and respondingly introduces a reply test shunt in accordance with the period of the shunt means. Means at the first end of the circuit sensitive to changes in track circuit parameters occasioned by the reply test shunt provides indication of vehicle presence when the change in track circuit parameters ceases.

3,663,810

ELECTRON-MULTIPLIER-IONIZER MASS SPECTROMETER

Donald R. Cone, Palo Alto, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Feb. 14, 1969, Ser. No. 799,363
Int. Cl. H01j 39/36
U.S. Cl. 250—41.9 TF 7 Claims



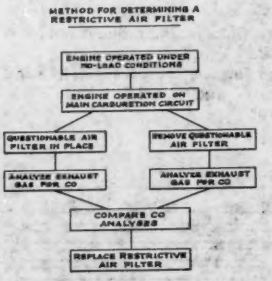
An electron multiplier used together with additional elements to form a simple spectrometer for mass distribution studies. The multiplier is used to multiply a few electrons to provide an electron cascade at the multiplier output end which provides a trigger pulse, serving as a time reference and to ionize molecules at the output end. The multiplier serves as a path for positive ions which accelerate towards the multiplier's input end, whereat they collide with a surface to produce secondary electrons, which are then multiplied by the multiplier as they accelerate to the output end to provide output pulses, whose time displacements from the trigger are indicative of the mass to charge ratio of the created ions.

3,663,811

METHOD FOR DETERMINING A RESTRICTIVE AIR FILTER

Frederick L. Voelz, 16133 118th Avenue, Orland Park, Ill.

Filed Oct. 21, 1970, Ser. No. 82,864
Int. Cl. G01n 15/00
U.S. Cl. 250—43.5 R 8 Claims


METHOD FOR DETERMINING A RESTRICTIVE AIR FILTER
ENGINE OPERATED UNDER NO-LOAD CONDITIONS
ENGINE OPERATED ON MAIN CARBURETION CIRCUIT
QUESTIONABLE AIR FILTER IN PLACE
REMOVE QUESTIONABLE AIR FILTER
ANALYZE EXHAUST GAS FOR CO
ANALYZE EXHAUST GAS FOR CO
COMPARE CO ANALYSES
REPLACE RESTRICTIVE AIR FILTER

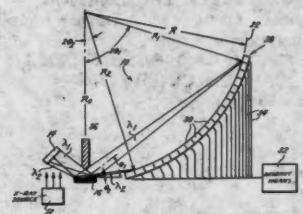
A method for determining whether a carburetor air filter element unduly restricts the flow of combustion air to an internal combustion engine is disclosed. This method comprises analyzing exhaust gases from an internal combustion engine operated at no load conditions on the main carburetion circuit both with and without the air filter element being tested in the air intake system. If the carbon monoxide concentration of the exhaust gases obtained without the element in the system is substantially reduced in comparison with the carbon monoxide concentration of the exhaust gases obtained with the element in the system, the air filter element unduly restricts the flow of air to the engine.

3,663,812

X-RAY SPECTROGRAPHIC MEANS HAVING FIXED ANALYZING AND DETECTING MEANS

Jude H. Koenig, San Jose, Calif.; James A. Schoeffel, Alton, Ill.; Gene J. Carron, St. Louis County, and Lionel K. Walford, St. Louis, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 27, 1969, Ser. No. 802,962
Int. Cl. G01n 23/20
U.S. Cl. 250—49.5 PE 25 Claims



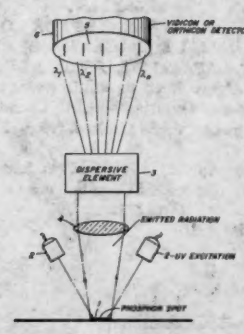
Means for analyzing the composition of materials including an excitation source of relatively high energy particles or radiations, and means for directing the particles or radiations from said source at a sample of the material to be analyzed so that X-rays of wavelengths that are characteristic of the sample constituents are given off. The subject means also include specially bent crystal means which are positioned to intercept and diffract the characteristic X-rays in an ordered manner, and detector means onto which the diffracted characteristic X-rays are directed, said X-rays producing responses at the detector means from which qualitative and quantitative information about the characteristic X-rays and hence about the constituents of the sample can be obtained.

3,663,813

OPTICAL READER FOR LUMINESCENT CODES LUMINESCING IN DIFFERENT WAVELENGTHS

Robert Frank Shaw, Bloomfield Hills, Mich., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 19, 1970, Ser. No. 3,992
Int. Cl. G01j 3/06
U.S. Cl. 250—71 R 4 Claims



Symbols formed by marking a substrate with coded inks, the coding represented by the absence or presence in one or more levels of one or more photoluminescent components, are irradiated with ultraviolet light and the photoluminescence from the various coding components is projected through a dispersing agent, such as a prism or a grating, onto the sensitive surface of a television camera tube, such as a vidicon or orthicon, the output of the camera tube producing electrical pulses in each scan corresponding to the position of

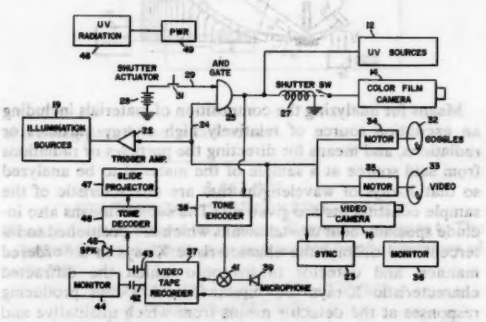
the various photoluminescent colors. The output can be read out on an oscilloscope or other readout device synchronized with the television camera electron scan. The presence of coding components are represented by pulses in corresponding positions and the height of the pulses can represent the level of component concentration if it is present in more than one concentration.

3,663,814

SYSTEM FOR DELINEATING SELECTIVE RESPONSE OF A MATERIAL TO RADIATION IN PRESENCE OF VISIBLE ILLUMINATION

Andrew Madsen, Alamo, Calif., assignor to Resource Data Corporation, Denver, Colo.

Filed Jan. 29, 1969, Ser. No. 795,119
Int. Cl. G01n *21/00*
U.S. Cl. 250—83.3 UV 4 Claims



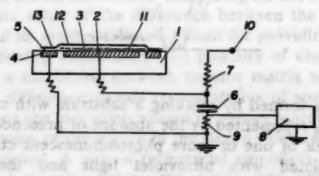
A pulsed visible illumination source illuminates a material to allow, for example, a helicopter pilot to fly over the surface of the earth in darkness. The visible light is interrupted to allow a pulsed ultraviolet source to stimulate luminescent reradiation from the material which reradiation is detected by observers and/or cameras. Both observers and camera are shielded by goggles or shutters so that the stimulated luminescence produced by the ultraviolet is not masked by the visible illumination. Such shutters are synchronized with the visible illumination pulses.

3,663,815

METHOD AND APPARATUS FOR COUNTING RADIATION DAMAGE TRACKS IN SHEET MATERIAL USING A CAPACITIVE DISCHARGE DEVICE

William Gunn Cross, Deep River, Ontario, and Luigi Tommasino, Toronto, Ontario, both of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Province of Ontario, Canada

Filed Apr. 23, 1969, Ser. No. 828,411
Claims priority, application Canada, Feb. 18, 1969, 043,252
Int. Cl. G01t *1/02*
U.S. Cl. 250—83.3 CD 6 Claims



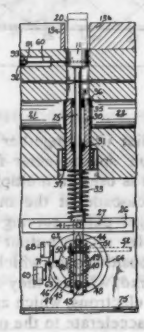
Fission fragment tracks produced in sheet mica and other electrical insulating materials of radiation dosimeters are counted by leaching the tracks so that they provide electrical discharge paths through the sheet, placing an aluminum foil on top of the sheet, applying a voltage between an electrode covering the underside of the sheet and the foil to sequentially puncture the foil by electrical discharges through the tracks and counting the discharges.

3,663,816

SAMPLE-CONVEYING MECHANISM FOR SCINTILLATION COUNTING

Walter O. Scherzer, Wallingford, Conn., and Edward W. Thomas, Northport, N.Y., assignors to Beckmann Instruments, Inc., Fullerton, Calif.

Filed May 20, 1966, Ser. No. 551,714
Int. Cl. G01t *1/20, 7/02*
U.S. Cl. 250—106 6 Claims



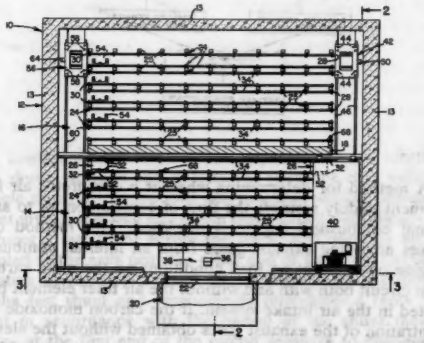
A conveying mechanism for transporting a sample vial from an external loading platform into a light-tight counting chamber of a scintillation counter. The invention comprises a wall defining a counting chamber having an elongated passage, the wall having a shoulder, a sample platform, having a shaft coupled thereto to position the platform through the passage and into the counting chamber, and a sleeve movable about said shaft for engaging the shoulder to prevent external light from entering the counting chamber.

3,663,817

RADIOACTIVE WASTE STORAGE SYSTEM AND METHOD

Robert P. Sayers, Chicago, Ill., assignor to FMC Corporation, San Jose, Calif.

Filed July 28, 1969, Ser. No. 845,360
Int. Cl. G21h *5/00*
U.S. Cl. 250—106 26 Claims



A system and method for storing radioactive waste, wherein the waste is placed in receptacles and the recepta-

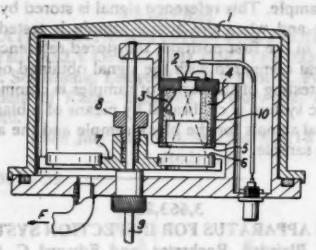
cles are moved selectively along a plurality of storage paths. The receptacles are retained selectively on said paths for periods of time dependent upon the periods required for the radioactivity of the waste therein to decay to predetermined levels.

3,663,818

METHOD AND APPARATUS FOR DETERMINATION OF A HIGHLY ACTIVE ELEMENT BY ALPHA PARTICLE

Marcel Guery, 31 bis, avenue Saint-Laurent, 91 Orsay, France, assignor to Commissoriat A l'Energie Atomique, Paris, France

Filed Dec. 30, 1969, Ser. No. 889,156
Claims priority, application France, Jan. 14, 1969, 6900457
Int. Cl. G01t *1/00*
U.S. Cl. 250—106 SC **2 Claims**



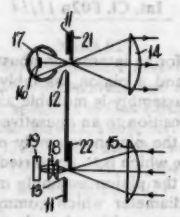
A method of determination of an element having high alpha activity and diluted in a substance having low alpha activity by alpha particle spectrometry of a source having a thickness at least equal to the path of the alpha particles which provide a spectral curve or so-called degraded spectrum having a practically rectilinear portion, wherein said method consists in determining the quantity of said high-alpha activity element contained in said source by measuring the area of one section of the degraded spectrum which is comprised between two fixed energies located between the limits of said rectilinear portion, said area after subtraction of the background and the contribution of the substance which has a low alpha activity being proportional to the content to be determined.

3,663,819

ROAD VEHICLE LIGHTING SYSTEM IN WHICH SAME SHUTTER OBSCURES PHOTOCELL WHEN SYSTEM IS OPERATIVE AND WHEN IT IS NOT ENERGIZED

Harris Vernon Hicks, Lichfield, and Roger William Nolan, Redditch, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 15, 1970, Ser. No. 55,018
Claims priority, application Great Britain, July 23, 1969, 36,946/69; Nov. 14, 1969, 50,312/69
Int. Cl. B60q *1/02*; F21v *11/18*; G01i *1/20*
U.S. Cl. 250—201 **8 Claims**



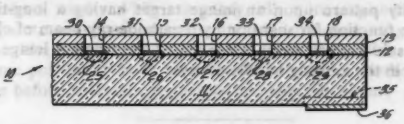
A lighting system for a road vehicle has the projector for producing a beam of light illuminating the road in front of the vehicle and a receiver with a photocell for receiving light from an oncoming vehicle. There is a first shutter movable to progressively cut off the projected beam, and a second shutter movable to progressively mask the photocell from light from an oncoming vehicle, so that the system achieves a condition wherein sufficient of the projected beam is cut off to avoid dazzling the driver of the oncoming vehicle. The second shutter is returned to a rest position, wherein the photocell is masked, when the projector is not energized, and means is provided for moving the second shutter, when the projector is energized to an inoperative position wherein light can fall on the photocell. This prevents saturation of the photocell during daylight hours.

3,663,820

DIODE ARRAY RADIATION RESPONSIVE DEVICE

Joseph Burns, Pequannock, N.J., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Oct. 7, 1970, Ser. No. 78,734
Int. Cl. H01j *39/12*
U.S. Cl. 250—211 J **6 Claims**



A silicon wafer has a plurality of spaced diode junctions formed in its upper surface and through openings in a silicon dioxide layer. A conductive grid is disposed over the silicon dioxide layer and has openings exposing the elemental diode surfaces. The top of the exposed diode surfaces are cesiated. Each of the diodes is reverse biased and the cesiated surfaces of the diodes emit electrons, appropriately adjusting their potential in response to radiation applied to the adjacent rear surface of the wafer.

3,663,821

IMAGE INTENSIFIER DEVICE AND METHOD FOR RECEIVING RADIANT ENERGY IMAGES FOR CONVERSION AND INTENSIFICATION

Jack Finkle, 918 East 14th Street, Brooklyn, N.Y.

Continuation-in-part of application Ser. No. 306,897, Sept. 5, 1963, now Patent No. 3,436,550, and 459,529, May 24, 1965, now Patent No. 3,482,104. This application Mar. 11, 1969, Ser. No. 806,323
Int. Cl. H01j *31/50*
U.S. Cl. 250—213 VT **7 Claims**

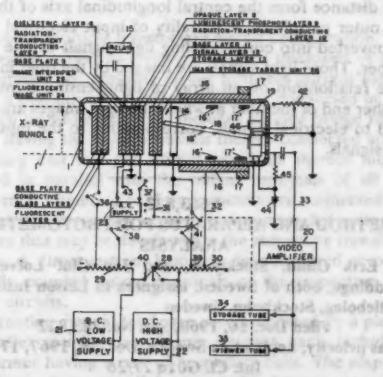


Image intensifier device and method for image intensification in which a bundle of ionizing radiation containing an intelligence pattern impinges upon a fluorescent layer of an

anode luminary structure to produce fluorescence and whose fluorescent output excites the further emission of photons from an adjacent image intensifier structure of the solid state type, the latter being connected in series with a unipotential source of high voltage and high frequency and said high voltage effecting further light emission from said intensifier structure, said unipotential source being further connected to a conducting layer of said fluorescent anode and to an actuating relay in a series arrangement such that said unipotential of high frequency is released to said image intensifier in an instantaneous "surge flow" concurrent with the transmission of the ionizing bundle through the face of an evacuated tube containing said fluorescing anode luminary unit and said image intensifier structure in cascade arrangement and further; said image intensifier being connected to a source of high alternating field frequency to further activate said image intensifier to produce light emission and an intensified image therefrom; the said activation being due to excitation of a dielectric layer so that the ionizing bundle evokes "charge transport" therethrough to an adjoining radiation-transparent opaque layer, and a photoelectro—luminescent phosphor layer, said activation being reinforced by the concurrently applied high voltage potentials to the conductor boundary layers of said intensifier structure, to produce a stored conductivity pattern upon an image target having a long-time storage function for scansion by a cathode-ray beam of electrons, said pattern being a replica of the original image inherent in the ionizing bundle of rays.

3,663,822

MULTI-TERMINAL OPTICAL CABLE UTILIZING A FLEXIBLE GRADED OPTICAL FIBER

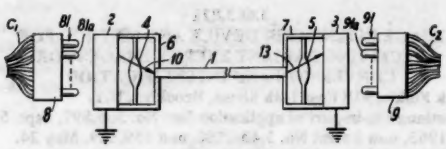
Teiju Uchida, Tokyo, Japan, assignor to Nippon Selfoc Company Limited, Tokyo, Japan

Filed Dec. 23, 1970, Ser. No. 101,039

Claims priority, application Japan, Dec. 29, 1969, 44/105248

Int. Cl. G02b *5/14*; H01j *39/12*

U.S. Cl. 250—217 S **9 Claims**



A multi-terminal optical cable includes an optical focusing fiber having a refractive index distribution in which the index varies in substantial inverse proportion to the square of the radial distance form the central longitudinal axis of the fiber to its outer periphery. A plurality of input electrical signals are converted into corresponding light signals at one end of the fiber. Those light signals are imaged by the fiber in a one-to-one relationship on an array of light-sensing elements at the other end of the fiber at which the light images are reconverted to electrical signals, corresponding to the input electrical signals.

3,663,823

METHOD AND APPARATUS FOR PHOTOMETRIC ANALYSIS

Lars Erik Ohlin, Stocksund, and Jan Olof Lofvenmark, Huddinge, both of Sweden, assignors to Linson Instrument Aktiebolag, Stockholm, Sweden

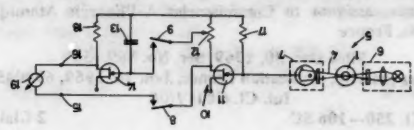
Filed Dec. 16, 1968, Ser. No. 783,822

Claims priority, application Sweden, Dec. 18, 1967, 17342/67

Int. Cl. G01n *21/26*

U.S. Cl. 250—218 **3 Claims**

A method and an apparatus for sequentially testing a series of samples in respect of the absorbency or another optical characteristic by means of a single-beam photometric system. The photometric system has a sample cell which is displaceable between a first position, in which it is in the path of light between the light source and the light-sensitive detector of the photometric system, and a second position, in which it is clear of the path of light. Immediately prior to each test a reference signal is generated with the sample cell in the second position and using the air in the path of light as a



reference sample. This reference signal is stored by means of a capacitor and when the actual sample is tested with the sample cell in the first position, the stored reference signal is retrieved and compared with the signal obtained on the test. Before the testing of the series of samples is commenced the photometric system is calibrated by means of a blank sample to give equal signals for the blank sample and the air used as a reference sample.

3,663,824

LENS APPARATUS FOR INSPECTION SYSTEM

William H. Blaisdell, Rochester, and Edward C. Cornelius, Fairport, both of N.Y., and Howard J. Emerson, Deerfield Beach, Fla., assignors to Eastman Kodak Company, Rochester, N.Y.

Original application Apr. 1, 1969, Ser. No. 812,107, now Patent No. 3,556,664, dated Jan. 19, 1971. Divided and this application Sept. 10, 1970, Ser. No. 71,044

Int. Cl. G01n *21/18*, *21/30*, *21/16*

U.S. Cl. 250—219 R **2 Claims**

Light is disclosed as being directed at and through a photographic web, the dispersed light exiting from such web being gathered by a cylindrical lens which is so masked that it may be employed, without modification, for webs of various widths.

3,663,825

STARTER MOTORS FOR INTERNAL COMBUSTION ENGINES

Roy Price Bowcott, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 10, 1970, Ser. No. 88,365

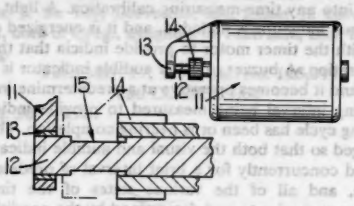
Claims priority, application Great Britain, Nov. 20, 1969, 56,822/69

Int. Cl. F02n *11/14*

U.S. Cl. 290—38 **7 Claims**

A starter motor for an internal combustion engine includes a rotatable shaft and a pinion assembly rotatable with the shaft. The pinion assembly is movable axially relative to the shaft from a rest position to an operative position wherein in use the pinion of the pinion assembly engages the toothed wheel of the engine which is to be started. The portion of the shaft along which the pinion assembly moves includes a region of reduced diameter which commences adjacent the pinion of the pinion assembly, when the pinion assembly is in its rest position, and which terminates within the pinion assembly when the pinion assembly is in its operative position.

The region of reduced diameter may be constituted by several smaller regions spaced apart by lands the diameter of which is equal to the diameter of the remainder of the shaft.

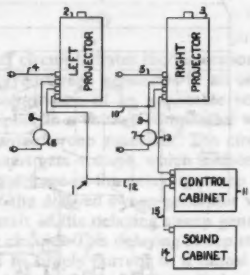


3,663,826

AUTOMATIC CONTROL SYSTEM FOR PROGRAMMING ELECTRICALLY OPERATED THEATER EQUIPMENT

Robert J. Schumann, Leawood, and Wayne A. Priest, Kansas City, both of Kans., assignors to Durwood, Inc., Kansas City, Mo.

Filed July 13, 1970, Ser. No. 54,210
Int. Cl. H02j *1/00*
U.S. Cl. 307—39 7 Claims



An automatic control system for selectively programming electrically operated theater equipment, such as sound equipment, house lights, curtain movement controls, screen size controls, special effects, and a plurality of film projectors wherein the control system includes an electrical circuit for activating equipment to perform its respective function in response to a signal from a counter circuit. The counter circuit is operative to produce a signal at each of a plurality of spaced time increments and the equipment activating circuits have inhibit means for holding the counter at a selected time increment during operation of the selected equipment and the equipment activating circuits have inhibit cancel means built into motor start and picture changeover circuits to prevent inhibit or stopping on these functions. A film break circuit is electrically connected to each of the film projector activating circuits for signaling the respective projector to stop in the event of a film break and a cueing circuit is electrically connected to each of the film projectors and to the counter for restarting the counter in response to a cue signal.

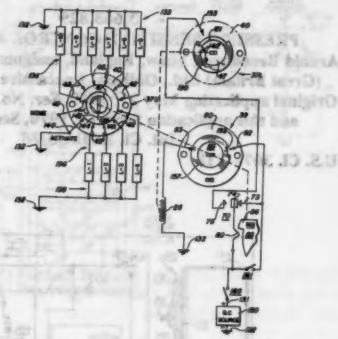
3,663,827

STEPPING ASSEMBLY AND CIRCUIT

Frederick M. Ford, Carpentersville, and Raymond J. Silhavy, Cary, both of Ill., assignors to Oak Electro/Netics Corp.

Original application May 22, 1969, Ser. No. 826,894, now Patent No. 3,582,579. Divided and this application May 27, 1970, Ser. No. 51,404
Int. Cl. H01h *43/14*
U.S. Cl. 307—41 5 Claims

An intervalometer uses a rotary switch mounted to base through shafts which maintain concentricity. An offset stepping mechanism drives the switch under control of a drive energizing circuit having interrupter contacts on the switch. A load energizing circuit includes additional contacts on the switch for sequentially energizing a plurality of independent loads, while shunting all nonenergized loads. Separate switch sections separate the drive energizing circuit from the load energizing circuit. When the switch is in a home position, it must be manually rotated to another position before automatic sequential stepping can occur.

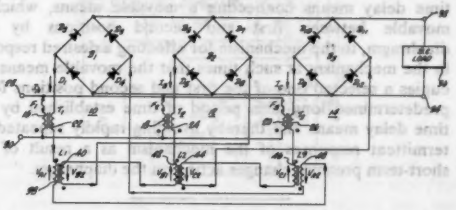


3,663,828

FAILSAFE MULTIPLE TRANSFORMER CIRCUIT CONFIGURATION

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Horacio Eduardo Gavira, 11350 E. Walcroft St., Lakewood, Calif.

Filed Oct. 20, 1970, Ser. No. 82,280
Int. Cl. G05f *1/48*
U.S. Cl. 307—83 11 Claims



A failsafe multiple transformer circuit configuration, useful in providing power to electrical loads is disclosed. A circuit configuration for applying power to direct current loads includes a plurality of transformer circuits connected in parallel. Each transformer circuit includes a diode bridge rectifier circuit having the input terminals thereof connected across a secondary coil and the output terminals thereof mutually coupled in parallel with the output terminals of all other transformer circuits. Equalizing reactors are connected in series with the secondary coils to compensate for voltage imbalances that may be developed in the respective transformer circuits. A direct current load may be connected across the mutually coupled output terminals of the respective transformer circuits.

Alternating current loads are accommodated by a plurality of parallel coupled transformer circuits each including a transformer having a pair of secondary coils. The respective secondary coils are parallel connected in two sets, one set for each half cycle. A diode rectifier is connected in series with each secondary coil and a silicon-controlled rectifier (SCR), associated with each set of secondary coils, is serially con-

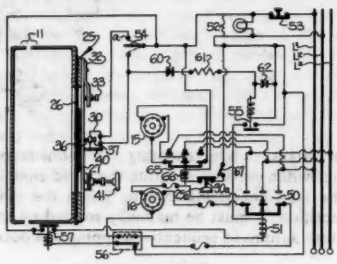
nected with an alternating current load. Equalizing reactors are employed in both sets of secondary coil circuits in the same manner as they were employed in the direct current configuration.

3,663,829

PRESSURE SENSITIVE CONTROL APPARATUS

Arnold Broadbent, Shaw, England, assignor to Parks-Cramer (Great Britain) Ltd., Oldham, Lancashire, England

Original application May 21, 1969, Ser. No. 826,550. Divided and this application Sept. 14, 1970, Ser. No. 71,661
Int. Cl. H01h 35/18
U.S. Cl. 307—118 4 Claims



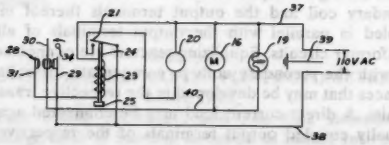
The control apparatus of this invention is for controlling the operation of a mechanism in response to repeated long-term changes in fluid pressure; e.g., a fiber-conveying air stream, wherein the fluid also is subject to short-term pressure changes such as are attendant to turbulence of an air stream, for example. The apparatus comprises a flexible diaphragm movable in response to both repeated long-term and repeated short-term pressure changes and also includes time delay means connecting a movable means, which is movable between first and second positions by the diaphragm, to the mechanism for effecting a desired response in the mechanism at such times that the movable means occupies a selected one of the first and second positions for a predetermined long-term period of time established by the time delay means and thereby avoiding rapidly repeated intermittent responses of the mechanism as a result of the short-term pressure changes acting on the diaphragm.

3,663,830

ELECTRIC TIMER

Clifford E. Miller, 5307 East 14th St., Oakland, Calif.

Filed June 29, 1970, Ser. No. 50,457
Int. Cl. H01h 43/14
U.S. Cl. 307—141 6 Claims



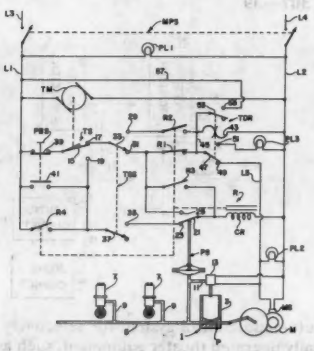
An electric timer for measuring predetermined time intervals to which the timer can be manually set. The timer includes a motor-driven main timing shaft equipped with an indicator hand moved by the shaft about a calibrated face subdivided into time intervals. The shaft is equipped with a knob to facilitate manual positioning of the hand at any selected time interval, and the timer is placed in operation by manual displacement of such knob, shaft, and hand from a zero time position into any time-measuring calibration. A light providing a visual indicator is included, and it is energized concurrently with the timer motor to provide indicia that the timer is in operation. A buzzer or other audible indicator is also included, and it becomes operative at a predetermine instant in any timing interval being measured to provide indicia that the timing cycle has been or is nearing completion. The timer is arranged so that both the visual and audible indicators are energized concurrently for a brief interval of predetermined duration, and all of the various states of the timer are generally responsive to and determined by the condition of a main control switch which is sequentially changed from a normal-run, to an alarm-run, and then to a non-run condition in accordance with predetermined angular position of the timing shaft during a timing cycle.

3,663,831

CONTROL CIRCUIT FOR LUBRICATING APPARATUS

John F. Cook, St. Louis, Mo., assignor to McNeil Corporation, Akron, Ohio

Filed Dec. 4, 1970, Ser. No. 95,303
Int. Cl. H01h 7/08
U.S. Cl. 307—141 11 Claims

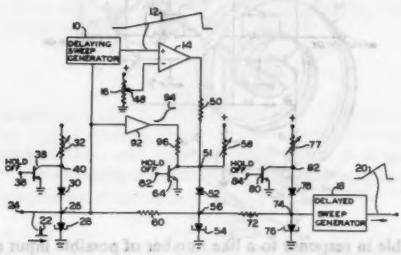


A control for periodically initiating operation of pumping apparatus of a lubricating system and stopping the pumping apparatus in response to development of a predetermined lubrication pressure in the system. The control includes an initiating switch which is periodically actuated, e.g., by a timer, a pressure-responsive switch which is actuated in response to development of the predetermined pressure, and a relay including sets of normally open and normally closed contacts. Circuitry includes a switch which is selectively operable to provide a first mode connecting normally closed contacts of the relay in a power circuit with the pumping apparatus for actuation thereof and also connecting the relay in an operating circuit with the pressure-responsive switch and with the timer switch to cause energization of the relay when the predetermined pressure is developed and deenergization thereof when the time switch is actuated. The switch also provides a second mode of operation connecting normally open contacts of the relay in the power circuit with the pumping apparatus for actuation thereof and also connecting the relay in an operating circuit with the pressure-responsive switch and with the timer switch to cause energization of the relay when the timer switch is actuated and deenergization thereof when the predetermined pressure is developed. Accordingly, in the first mode, operation of the pumping apparatus is initiated for an initial lubrication cycle when the power is turned on, i.e., applied across the power circuit, and thereafter operation of the pumping apparatus is at periodic lubrication intervals determined by the timer. In the second mode, operation of the pumping apparatus is solely at lubrication intervals determined by the timer.

3,663,832
DELAY PICKOFF CIRCUIT

William J. De Vey, Beaverton, and Lester L. Larson, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 17, 1971, Ser. No. 125,211
Int. Cl. H03k 4/08
U.S. Cl. 307—228 7 Claims



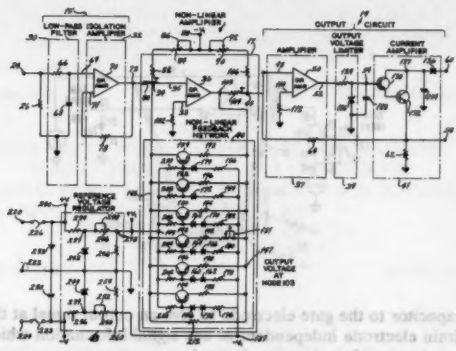
A delay pickoff circuit initiates the generation of the ramp voltage of a delayed sweep generator of an oscilloscope in response to a comparison of an adjustable voltage from a delay time multiplier in a voltage comparator with the ramp voltage of a delaying sweep generator. The circuit utilizes a delaying sweep start gate voltage, which initiates the generation of the ramp voltage of the delaying sweep generator, to cause starting of the delayed sweep generator with less time delay after the start of the delaying sweep generator than is possible in prior circuits. This delaying sweep start gate voltage is employed to supply current to a tunnel diode which causes the tunnel diode to change from its low to high voltage state to thereby cause production of a delayed sweep start gate voltage when this operation of the tunnel diodes is enabled by a signal from the comparator as a result of setting the delay time multiplier at its zero delay setting. Current derived from the delaying sweep start voltage also conditions the tunnel diode for a similar change as a result of a signal from the comparator produced by a voltage comparison when the multiplier is set for substantially greater delays. A voltage derived from the delaying sweep start gate voltage and having a lesser rise time than the delaying sweep start gate voltage is employed to supply a part of this current to the tunnel diode in order to smooth the transition between these two conditions of operation of the tunnel diode.

3,663,833
SQUARE ROOT EXTRACTOR FOR A PROCESS CONTROL SYSTEM

Robert K. C. Pao, and Louis H. Fricke, Jr., both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 2, 1970, Ser. No. 25,126
Int. Cl. G06g 7/12
U.S. Cl. 307—229 11 Claims

A square root extractor circuit adapted for operation in a process control loop wherein a differential pressure transducer generates a process variable signal which is proportional to the square of the flow rate of the process being controlled. The square root extractor circuit includes a nonlinear amplifier having a nonlinear feedback network therein including a plurality of parallel connected electroresponsive devices. These electroresponsive devices are successively biased into conduction in response to an increasing level of the input signal applied to the nonlinear amplifier, so that the

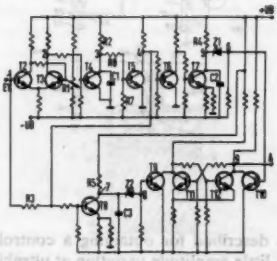


amplifier has a smooth, exponentially shaped voltage gain characteristic which approximates the square root function.

3,663,834
CIRCUIT ARRANGEMENT FOR LEVEL SUPERVISION IN TRANSMISSION SYSTEMS WITH FREQUENCY-OR PHASE MODULATION

Joachim Siglow, Wolfratshausen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed July 28, 1970, Ser. No. 58,870
Claims priority, application Germany, July 29, 1969, P 19 38 510.5
Int. Cl. H03k 5/20
U.S. Cl. 307—235 5 Claims



Circuitry is described for supervising the signal levels in frequency or phase modulation transmission systems by means of an evaluation circuit which emits a first signal if a predetermined threshold level is exceeded by the carrier frequency. A second signal is emitted if the carrier frequency undershoots said threshold level. A threshold circuit recognizes when the carrier frequency exceeds the predetermined threshold level and operates to actuate a first time element which is designed to determine whether the carrier signal has failed to reach the threshold level during a specified time period.

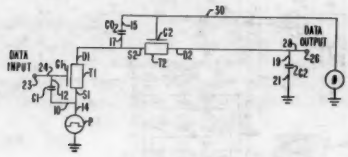
3,663,835
FIELD EFFECT TRANSISTOR CIRCUIT

William K. Hoffman, Shelburne, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1970, Ser. No. 6,495
Int. Cl. H03k 17/00
U.S. Cl. 307—246 7 Claims

A circuit has a field effect transistor (FET) with source, drain and gate electrodes, and a capacitor connecting the

source and gate electrode. Means is provided for applying a sufficient pulse to the source electrode and through the capacitor to the gate electrode to give an output signal at the drain electrode independent of any signal information which may be stored on the gate electrode.



3,663,836

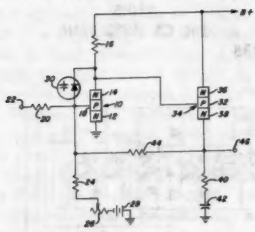
PHASE SHIFTER FOR ULTRAHIGH FREQUENCIES

Rafael Fernandez-Sein, San Germar., P.R., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 9, 1970, Ser. No. 45,103

Int. Cl. H03k *1/12*

U.S. Cl. 307—262 **5 Claims**



A circuit is described for obtaining a controllable phase shift with very little amplitude variation at ultrahigh frequencies, the circuit being entirely solid state and readily integrated. This is achieved by a shunt-series feedback pair of transistors wherein the output of a first transistor is applied through a second emitter follower transistor and a feedback path to the base of the first transistor, together with a variable capacitance diode connected in shunt with the collector-base junction of the first transistor.

3,663,837

TRI-STABLE STATE CIRCUITRY FOR DIGITAL COMPUTERS

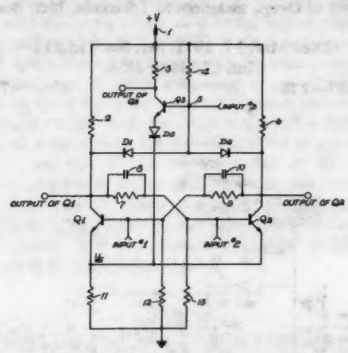
George Epstein, Malibu, and Hideki Yamanaka, Los Angeles, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 24, 1971, Ser. No. 146,034

Int. Cl. H03k *3/14*

U.S. Cl. 307—289 **8 Claims**

A tri-stable circuit preferably instrumented in solid state components. The circuit resembles a modified ECCLES-JORDAN "flip-flop" with an extra stage providing a third stable state. The circuit responds to the combination of three input logic values, each in straightforward binary form. Three unique logical output combinations also in binary form are available in response to a like number of possible input combinations.



3,663,838

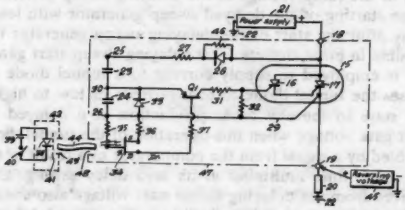
OPTICALLY TRIGGERED THYRISTOR

Eberhart Reimers, 7700 Random Run L. #201, Falls Church, Va.

Filed Oct. 16, 1970, Ser. No. 81,308

Int. Cl. H03k *17/00*

U.S. Cl. 307—311 **5 Claims**



A thyristor circuit employing optical triggering of the thyristor and wherein the new circuit configuration thereof provides complete isolated gate triggering of the thyristor without implementation of direct or electromagnetic gate coupled triggering means.

3,663,839

THERMAL MOTOR

George M. Low, Acting Administrator of the National Aeronautics and Space Administration in respect to an invention of; Lloyd J. Derr, 4624 Wille Lee, La Crescenta, Calif., and Robert A. Tobias, 1523 Harding Avenue, Pasadena, Calif.

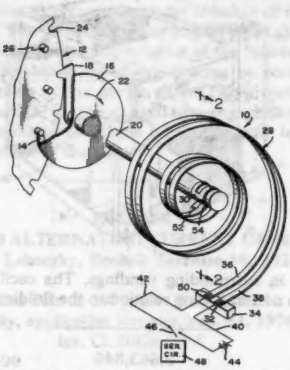
Continuation-in-part of application Ser. No. 856,415, Sept. 9, 1969, now Patent No. 3,562,575. This application Feb. 24, 1971, Ser. No. 118,270

Int. Cl. H02m *7/00*

U.S. Cl. 310—4 **5 Claims**

An electrically powered actuator for providing a rotational or large linear motion, which is simple and highly reliable, including a bi-metallic strip with a slot extending along its length from one end to a position near the opposite end. In a rotational actuator, the strip is bent into a spiral, with the inner turn fixed to the shaft which is to be rotated and the outer turn fixed to a support and connected to electrical

leads. Current passed through the leads and through the slotted strip heats it to make it uncoil or to make it coil further, the several rotations of the strip resulting in a large rotation of the shaft.

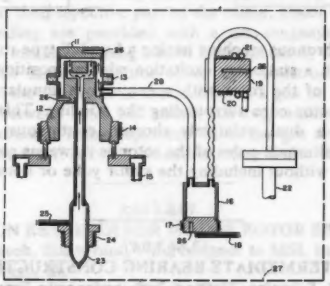


3,663,840

THERMIONIC CONVERTER WITH ADDITIVES

Firooz Rufeh; David P. Lieb, both of Lexington, and Robert C. Howard, Wayland, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Oct. 24, 1968, Ser. No. 770,325
Int. Cl. H01j *45/00*
U.S. Cl. 310—4 **4 Claims**



A method and device for providing both electronegative and electropositive adsorbates to the emitter and collector surfaces of thermionic converters. The adsorbates are contained in a single reservoir and are provided at a temperature which is compatible with that at which the converter operates.

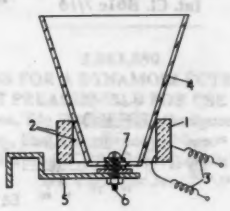
3,663,841

ULTRASONIC TRANSDUCERS

Joseph Donald Parker, London, England, assignor to Electro-Mechanical Design Limited, London, England

Filed Apr. 22, 1970, Ser. No. 30,702
Int. Cl. H01V *7/100*
U.S. Cl. 310—8.2 **5 Claims**

An ultrasonic transducer which includes a piezo-electric element of annular form having electrodes provided upon its inner and outer curved surfaces to permit the crystal to be vibrated in the circumferential mode, wherein a radiating member in the form of a cup or tube closed at one end is fitted to the annulus, support means being attached to the bottom of the cup or tube.

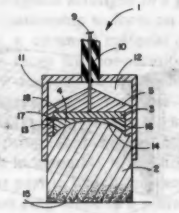


3,663,842

ELASTOMERIC GRADED ACOUSTIC IMPEDANCE COUPLING DEVICE

Darrow L. Miller, Los Angeles, Calif., assignor to North American Rockwell Corporation

Filed Sept. 14, 1970, Ser. No. 72,057
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.3 **7 Claims**



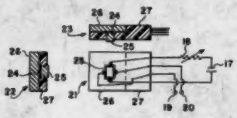
An ultrasonic probe has a solid, flexible, elastic, graded acoustical impedance coupling device having fine geometrical and naturally shaped, metal and glass component powders, with their characteristic acoustic impedance values, disposed in graded varying concentrations in solid, elastomeric silicones, polyurethane, or the like low acoustic impedance, solid elastomers, providing a shaped, composite matrix coupling or a delay line. The graded matrix of component fine shaped powder in an elastomer provides a proximate matching impedance adjacent to the interface with the flat piezoelectric transducer at one device end, and a similar matching impedance near the interface to the inspected workpiece at the other device end, with intermediate low-loss graded impedance values inbetween. When a lens is employed, an effective tapered impedance can be obtained at the interface with the test article by graduating the solid concentrations primarily at the workpiece end. The elasticity of the device provides close conformation with the inspected workpiece surface, and reduces the acoustic reflection due to surface roughness and irregularities.

3,663,843

HALL EFFECT TRANSDUCER

David L. Smith, Hampton, Va., assignor to The United States of America as represented by the administrator of the National Aeronautics and Space Administration

Filed Mar. 19, 1971, Ser. No. 125,979
Int. Cl. H01c 7/16
U.S. Cl. 310—10 7 Claims



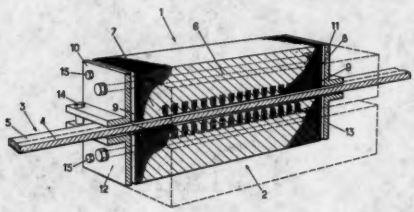
A Hall effect transducer that produces output voltages directly proportional to rotary shaft displacements. The linearity of this transducer is extended to a range of input shaft rotation up to ±50° by means of a special Hall probe.

3,663,844

ASYNCHRONOUS MACHINE HAVING AN OPEN MAGNETIC CIRCUIT

Michel Kant, Paris, and Robert Bonnefille, Issy-les-Moulineaux, both of France, assignors to ANVAR Agence Nationale De Valorisation De La Recherche, Tour Aurore, Paris-Defense, Courbevare, France

Filed Mar. 15, 1971, Ser. No. 124,359
Claims priority, application France, Mar. 13, 1970, 7009032
Int. Cl. H02k 41/02
U.S. Cl. 310—13 3 Claims



Asynchronous machine having an open magnetic circuit comprises a field member including central and end sections. The central section is fully wound with a polyphase winding and a monophase winding. The end sections are unwound or partially wound with a monophase winding. The central section has an odd or fractional number of poles and the length of the end sections are from zero to 1 pole pitch long.

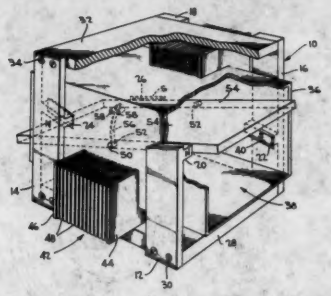
3,663,845

FLUIDIC GENERATOR

Maurice Apstein, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 18, 1971, Ser. No. 116,364
Int. Cl. H02k 35/06
U.S. Cl. 310—15 10 Claims

A fluidic electric generator having a balanced reed positioned as a rocking member in an air conduit. A spring connected between the reed and the conduit biases the reed in a balanced position. Air flow through the conduit causes the reed to rock at a resonant frequency due to the biasing action of the spring. As the reed rocks, it changes the magnetic reluctance between sets of opposing magnetic poles and causes reversal of flux through the reed thereby inducing an AC signal in surrounding windings. The oscillating reed is oriented in non-impeding relation to the fluidic flow.

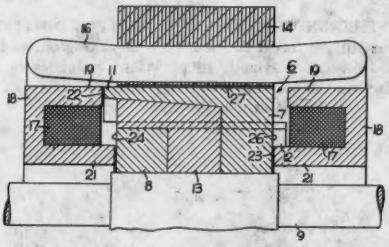


3,663,846

CLAW-TOOTH ROTOR DYNAMOELECTRIC MACHINE

Paul D. Wagner, 549 Ludlow Ave., Cincinnati, Ohio, and John J. Keuper, 7 Alanna Drive, Cold Springs, Ky.

Filed June 7, 1971, Ser. No. 150,685
Int. Cl. H02k 1/22
U.S. Cl. 310—164 2 Claims



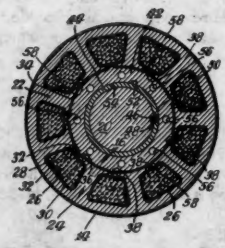
A synchronous machine having a Lundell-type rotor is provided with a stationary excitation winding positioned at the axial end of the rotor with a continuous annular magnetic flux collector core surrounding the winding. This collector provides a dual, relatively shorter, continuous flux path between alternate poles of the rotor as it sweeps past the flux collector without including the stator yoke or housing in the flux path.

3,663,847

INTERMEDIATE BEARING CONSTRUCTION

Edward J. Schaefer, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Sept. 18, 1970, Ser. No. 73,443
Int. Cl. H02k 5/16
U.S. Cl. 310—90 13 Claims



An intermediate bearing for a motor of great length, comprising an inner annular member secured to the shaft of the

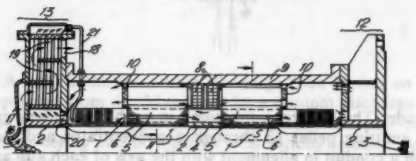
motor, and an outer annular member. Bearing surfaces are provided on the inner and outer members. The inner member is secured to the shaft and rotates with the shaft in the outer member. The outer member is secured within the cavity of the stator of the motor by projections on the bearing which engage the stator to prevent the outer member of the bearing from rotating. The projections may engage axial slots formed in the stator, thus preventing rotation of the bearing but permitting axial displacement of the bearing to accommodate thermal expansion of the motor parts. The projections may be fixed in position, or may expand into engagement with the stator upon exposure to certain liquids, or may be cammed into engagement with the stator.

3,663,848

HIGH-SPEED ALTERNATING CURRENT GENERATORS

Kalman Nagy Lehoczky, Broholt Terrasse 10, 3024 Hyggen, Norway

Filed Feb. 2, 1971, Ser. No. 111,836
Claims priority, application Norway, Feb. 11, 1970, 478/70
Int. Cl. H02k 7/08
U.S. Cl. 310—90 6 Claims



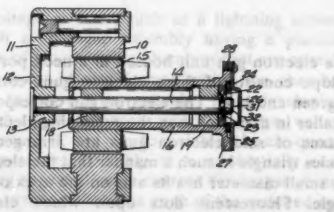
A high-speed alternating current generator, for example, a gas turbine driven generator, presents complex of constructional problems. The high-speed alternating current generator of the invention is of the equi-pole type having magnetizing coils in the stator and, two or more pole units of the same polarity arranged in sequence on a common rotor. At least one bearing is formed along the rotor, the bearing being so formed that the respective part of the stator, stator laminate and/or winding are provided with a non-magnetic and/or electrically insulating lining which is permanently anchored to the stator laminate and/or other rigid construction elements, and the lubricant in the bearing is a gas or liquid in the space between rotor and stator. An evaporation-cooling system is chosen, being separated from the gas space surrounding the rotor. A twin unit construction is also disclosed.

3,663,849

SNAP-ON RETAINER FOR MOTOR ROTOR SHAFT

Norvel J. Heob, Sturtevant, Wis., assignor to MSL Industries, Inc., Chicago, Ill.

Filed Dec. 31, 1970, Ser. No. 103,105
Int. Cl. H02k 7/08
U.S. Cl. 310—90 7 Claims



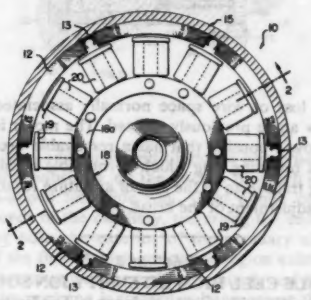
Retaining and positioning mechanism for the rotor of an electric motor. The rotor axle is provided with a groove and the rotor assembly is provided with a snap-on thrust retainer with prongs which will bend axially to snap into the axle groove, thus to key the rotor to the stator and contain end play of the rotor in both axial directions. End play control is unitized at the retainer. The invention makes it possible to preassemble the rotor with its retaining and positioning mechanism prior to final assembly of the rotor with the stator. Final assembly consists simply of snapping the rotor into place on its axle.

3,663,850

FIELD MEANS FOR A DYNAMOELECTRIC MACHINE, MAGNET PREASSEMBLY FOR USE THEREIN

Russell E. Phelon, Rio Piedras, P.R., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Aug. 3, 1970, Ser. No. 60,296
Int. Cl. H02k 21/22
U.S. Cl. 310—153 16 Claims



The rotor of an electric alternator includes permanent magnet material for establishing a magnetic field which rotates with the rotor. The permanent magnet material may be in the form of a single ring of such material magnetically charged to provide a plurality of angularly spaced magnetic poles. The magnetic material may also be in the form of a plurality of separate magnets arranged in a generally end face to end face, spaced relationship to form an annular ring. The magnetic material is a ceramic material and the magnets directly provide pole faces for cooperation with the stator poles and are radially magnetically charged to include more than one magnetic pole on each pole face. When a plurality of magnets are used to form the magnet ring a compressible resilient spacer or spring member is placed between two magnets to hold them in assembly with a temporary shipping band or with the rotor part in which they are finally installed. In assembling a magnet ring made of a plurality of magnets, a deformable insert may be placed between two adjacent magnets and then deformed to enlarge the gap in which it is received, thereby compressing the spring member. If the magnets are first formed into a preassembly with a shipping band for later assembly with a rotor part, and if a deformable insert is used to control the compression of the spring member, the deformable insert in forming the preassembly is preferably deformed only to a degree sufficient to hold the preassembly in assembly with only a degree of tightness sufficient to withstand normal handling, and after the magnets are inserted in the final rotor part and the shipping band removed, the deformable insert is deformed to a further extent to hold the magnets in assembly with the rotor part with a greater degree of tightness.

3,663,851

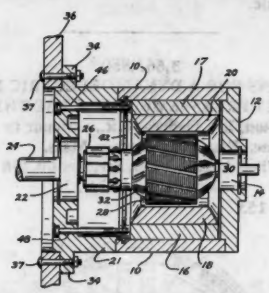
D.C. MOTOR

Erland K. Persson, Minneapolis, Minn., assignor to Electro-Craft Corporation, Hopkins, Minn.

Filed Sept. 21, 1970, Ser. No. 73,796
Int. Cl. H02k 21/26
U.S. Cl. 310—154 10 Claims

A d.c. motor having large, semicylindrical, chamfered pole pieces of soft magnetic material for focusing the magnetic

flux of two permanent magnets onto the armature of the motor to provide an increased flux density. the armature has skewed slots and the edges of the pole pieces are skewed in opposition to the skewed slots to achieve the effect of a complete slot pitch skew in a short armature stack without



having the loss of wire space normally associated with the severe skew angle previously utilized. The motor is mounted in an improved housing that has a removable brush cap attached to a retaining ring which is rotatable within a slot in the housing transverse to the axis of armature rotation to permit rotary adjustment of the brush cap.

3,663,852

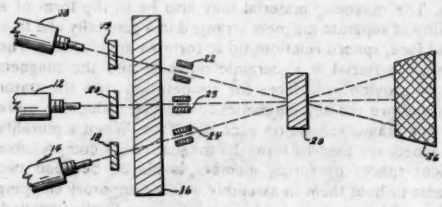
DOUBLE CELL HIGH INTENSITY ION SOURCE

John S. Luce, Danville, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Apr. 1, 1970, Ser. No. 24,941

Int. Cl. H01j *27/00, 39/00*

U.S. Cl. 313—63 **9 Claims**



The instant invention involves a system for generating high current density charged particle beams. The system includes a plurality of high intensity ion sources in combination with two charge exchange cells aligned linearly with one another. The ions are converted from one type of charge to an opposite charge in two stages. In the first stage, several beams of positive ions, for example, derived from a plurality of positive ion sources are beamed into a charge exchange cell and converted into neutrals. The several beams of neutrals from the first cell are then directed into a second charge exchange cell where the neutrals are converted into negative ions.

3,663,853

TRIODE ELECTRON GUN WITH POSITIVE GRID AND MODULAR CATHODE

Jean Sommeria, Annecy, France, assignor to Societe Alsacienne De Constructions Atomiques De Telecommunications Et D'Electronique "Alcatel,", Paris, France

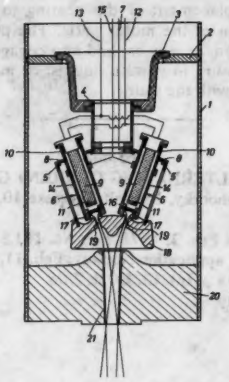
Filed July 29, 1970, Ser. No. 59,224

Claims priority, application France, July 29, 1969, 6925987

Int. Cl. H01j *29/04, 29/48, 29/56*

U.S. Cl. 313—82 R **5 Claims**

Triode electron gun with positive control grid, with emitting cathode, and with acceleration anode, providing a concentration and emission of electrons directed along straight and parallel paths. Thus gun includes several elementary guns distributed around a single axis, the axes of the guns converging toward one and the same point on the axis situated at the entrance to an axial conical conduit drilled in



the anode. The electrons produced in each elementary gun by an emitting pellet go through a concentrator and then through a conduit in alignment with the axis of each gun and perforated in a single thick grid. The invention can be applied in metallurgy for melting and heating.

3,663,854

SHADOW-MASK HAVING RECTANGULAR APERTURES

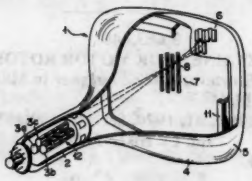
Asahide Tsuneta, Kawasaki, and Makoto Ikegaki, Saitama-ken, both of Japan, assignors to Tokyo Shibaura Elecric Co., Ltd., Kawasaki-shi, Japan

Filed Feb. 12, 1970, Ser. No. 10,978

Claims priority, application Japan, Feb. 17, 1969, 44/11084

Int. Cl. H01j *29/06, 31/20, 29/30*

U.S. Cl. 313—85 S **4 Claims**



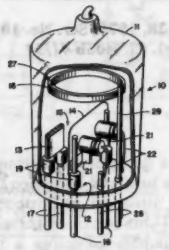
The electron gun unit housed in a neck portion of a tube envelope consists of three electron guns corresponding to red, green and blue. The electron gun corresponding to blue is smaller in diameter than the remaining electron guns, and the axes of said electron guns are arranged to form an isosceles triangle in such a manner that the electron gun having a small diameter has its axis on the apex of the isosceles triangle. Fluorescent dots upon which electron beams emitted from said electron guns impinge are substantially in the form of thin rectangles or ellipses which extend substantially at right angles to the beam scanning direction. Adjacent to said fluorescent dots is disposed a shadow-mask having a plurality of rectangularly shaped beam passing holes.

3,663,855

COLD CATHODE VACUUM DISCHARGE TUBE WITH CATHODE DISCHARGE FACE PARALLEL WITH ANODE

Gordon E. Boettcher, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Atmoic Energy Commission

Filed Feb. 24, 1967, Ser. No. 619,137
Int. Cl. H01j 19/44, 19/70
U.S. Cl. 313—178 7 Claims



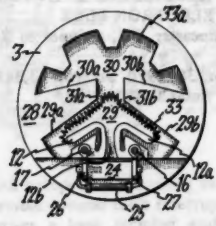
A cold cathode vacuum discharge tube having an anode separated from a cold cathode by a vacuum discharge gap, a gas generating trigger probe contiguous with said cathode and gettering means, together with various embodiments and circuitry.

3,663,856

CURRENT LIMITING SPARKGAP WITH MEANS FOR REGULATING GAP VOLTAGE

Stanley A. Miske, Jr., Pittsfield, Mass., assignor to General Electric Company

Filed Aug. 17, 1970, Ser. No. 64,299
Int. Cl. H01j 17/00, 21/00
U.S. Cl. 313—325 10 Claims



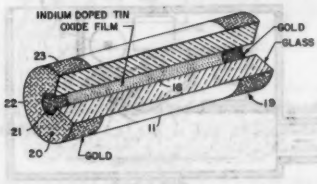
A surge voltage arrester, such as a lightning arrester, is provided with a sparkgap assembly having a plurality of matched pairs of arc-confining chambers that are operable to regulate movement of arcs formed within the chambers of the assembly to prevent the assembly from developing undesirably high peak voltages when a surge voltage is discharged through it, and also to maintain the arc-quenching voltage rating of the assembly at a substantially constant value following repeated surge current discharges. A narrow passageway is provided between each of the matched pairs of arc-confining chambers in order to allow small-current arcs to move between the two chambers while confining large-current arcs to a single one of the chambers, thus, one of the chambers is protected from exposure to destructive erosion and contamination by large-current arcs.

3,663,857

ELECTRON EMITTER COMPRISING METAL OXIDE-METAL CONTACT INTERFACE AND METHOD FOR MAKING THE SAME

Arthur M. Soellner, Cape Girardeau, Mo.; James F. Sprouse, North Little Rock, and Triponithura A. Raju, Little Rock, both of Ark., assignors to Avco Corporation, Tulsa, Okla.

Filed Feb. 13, 1969, Ser. No. 799,056
Int. Cl. H01j 1/20
U.S. Cl. 313—339 1 Claim



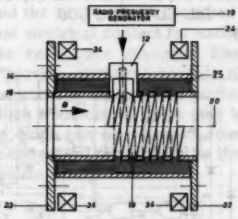
The electron emitter herein disclosed comprises a tubular glass capillary substrate, on the interior of which is deposited an indium-doped tin oxide film. Gold ohmic contacts embrace the ends of the capillary, traversing the end edges and overlapping both the exterior of the capillary and the end margins of the film. A high-resistance region exists at the interface between at least one of the contacts and the oxide. It is formed by applying increased voltage across the contacts until there is a current increase independently of applied voltage, followed by a decrease in film conductivity.

3,663,858

RADIO-FREQUENCY PLASMA GENERATOR

Giuseppe Lisitano, Max-Planche-Strasse 7, Garching near Munich, Germany

Filed Nov. 6, 1970, Ser. No. 87,534
Claims priority, application Germany, Nov. 6, 1969, P 19 55 914.9
Int. Cl. H01j 7/46, 19/80
U.S. Cl. 315—39 5 Claims



A plasma generator which utilizes radio frequency power and is of the kind having a slotted transmission line consisting of a hollow tubular body electrically matched to an RF generator, in which the hollow body makes up a delay line in which the RF energy is caused to propagate with a time delay in the direction of the axis of said hollow body the radiofrequency power, by enabling heating of the plasma independent of the intensity of a magnetic field used for confining the plasma, provides a highly dense plasma.

3,663,859

SENSITIVE LIGHT AND SMOKE DETECTING DEVICE WITH MEMORY SYSTEM

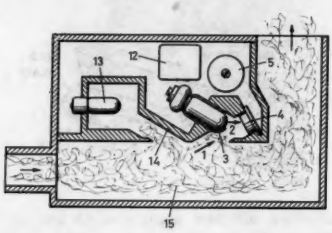
Shinji Saito, 1-306, Maita-cho, Minami-ku, Yokohama, Japan

Continuation-in-part of application Ser. No. 785,835, Oct. 18, 1968, now abandoned. This application Nov. 23, 1970, Ser. No. 91,782

Claims priority, application Japan, Oct. 25, 1967, 42/68326

Int. Cl. G08b 17/10

U.S. Cl. 315—151 4 Claims



This invention discloses a novel sensitive light and smoke detecting device using a photoelectric element connected in series with a parallel circuit of a discharge tube and a resistance. The decrease in resistance of the photoconductor by reason of an incoming small amount of light dimly lights said discharge tube by increasing the divided current of the parallel circuit and the resulting radiating light from the discharge tube further reduces the resistance of the photoconductor until both photo-electric element and discharge tube mutually react to the fullest extent whereby the discharge tube provides a positive optical feed back to the photoconductor to denote the presence of light and smoke. The circuit provides a signal even after removal of the initially detected light or smoke. The small amount of initial light may be furnished by a dimly lit pilot lamp which is secluded by a wall between the photoconductor and the discharge tube but light can reach the photoconductor by reflection of small amount of incoming smoke and initiate action of the device of this invention.

3,663,860

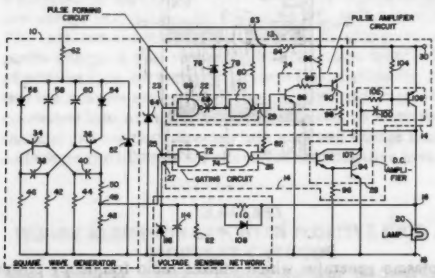
SHORT CIRCUIT PROOF FLASHER CIRCUIT

Robert A. Phillips, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 25, 1970, Ser. No. 14,015

Int. Cl. H05b 37/00

U.S. Cl. 315—200 11 Claims



Load current control circuitry including means for generating a driving signal with a predetermined duty cycle. Current control circuit means are connected between a load terminal and the generating means and provide different and selected levels of load current to an electrical load which is connected to the load terminal. The first level of current is that required during the initial energization of the load, and this initial current is provided by a starting network within the current control circuit means. The current control circuit means also includes a load steady state current supply and short circuit protection circuit which is connected between the generating means and the electrical load. The latter circuit is responsive to a predetermined voltage developed across the electrical load for providing a steady state DC current to the load after the latter has been initially energized.

3,663,861

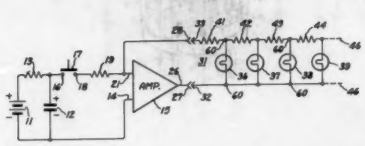
CIRCUIT UTILIZING FEEDBACK AMPLIFIER FOR SEQUENTIALLY FLASHING PHOTOFLASH LAMPS

Sang-Chul Kim, Cleveland Heights, Ohio, assignor to General Electric Company

Filed Dec. 28, 1970, Ser. No. 101,797

Int. Cl. H05b 41/34

U.S. Cl. 315—232 7 Claims



A circuit combination of impedance devices and a feedback amplifier for causing sequential flashing of a plurality of photoflash lamps by sequential firing voltage pulses. The amplifier is connected between the source of firing pulses and the impedance network formed by the impedance devices and flash lamp filaments, and the impedance network is connected to provide inverse feedback to the amplifier to vary its gain in accordance with changing impedance of the impedance network as the various lamps are flashed, so that the lamps will be flashed by equal amounts of firing pulse energy.

3,663,862

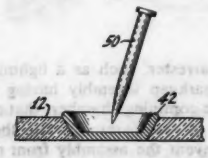
METHOD OF REBUILDING AN EVACUATED ELECTRON TUBE

Alan Paul Haines, Lancaster, Pa., assignor to RCA Corporation

Filed Apr. 30, 1970, Ser. No. 33,388

Int. Cl. H01j 9/50

U.S. Cl. 316—2 4 Claims



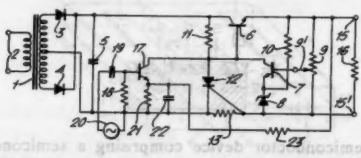
A method of rebuilding a cathode ray tube, including the penetration of a metallic part of the tube by means of a pointed tool, for example. Defective parts of the vented tube can be replaced or the re-usable parts thereof can be reclaimed. The opening in the metallic part of the tube can be hermetically sealed with a frit material or by sealing to the metallic part a pin that is inserted in the opening therein.

3,663,863

OVERCURRENT PROTECTOR

Ichiro Arimura, Kyoto; Hiroshi Goto, Oaza-Hoshida; Hiroshi Matsushima, Osaka, and Yoshikazu Nakao, Hirakata, all of Japan, assignors to Matsushita Electric Ind., Co. Ltd., Kadoma City, Osaka Prefecture, Japan

Filed Oct. 8, 1970, Ser. No. 79,220
Claims priority, application Japan, Oct. 8, 1969, 44/80942
Int. Cl. H02h 3/08
U.S. Cl. 317—22 10 Claims



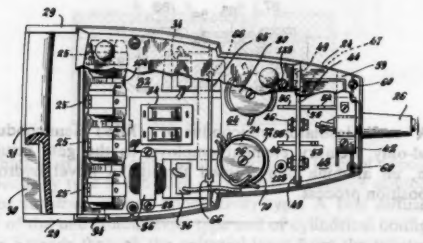
An overcurrent protector including a thyristor which detects an overcurrent condition in a load and turns on, thereby making a current-controlling transistor cut off in order to protect the load from said overcurrent. The improvement lies in the provision of a switching element connected to the thyristor, which, upon elimination of the overcurrent condition, automatically functions to turn off the thyristor without any manual operation.

3,663,864

PORTABLE GOUND FAULT INTERRUPTER APPARATUS

Ernest R. Carlson, Fairfield; Czeslaw Mackiewicz, Trumbull, and Paul C. Mirmina, Milford, all of Conn., assignors to Harvey Hubbell, Incorporated, Bridgeport, Conn.

Filed Apr. 15, 1970, Ser. No. 28,576
Int. Cl. H02b 1/02
U.S. Cl. 317—101 DH 12 Claims



A housing and component mounting assembly is described for a hand-portable ground fault interrupter apparatus. The housing comprises a base member and a cover member which includes a readily demountable electric receptacle plate. The components are arranged for compartmentizing the housing. The described arrangement enhances portability and receptacle replacement as well as increasing protection from electrical shock hazards.

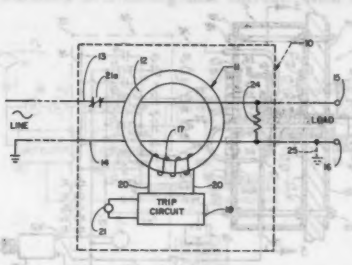
3,663,865

DIFFERENTIAL GROUND FAULT PROTECTION SYSTEM

Harris I. Stanback, Lexington, Ky., assignor to Square D Company, Park Ridge, Ill.

Filed July 14, 1970, Ser. No. 54,766
Int. Cl. H02h 3/28
U.S. Cl. 317—18 D 3 Claims

A ground fault protection system using a differential current transformer. So that an inadvertent low impedance ground of the grounded neutral conductor on the load side of a differential transformer will cause a tripping potential to be developed across the secondary winding of the differential



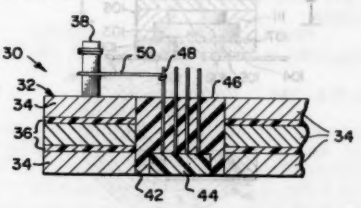
transformer, a resistor is connected across the load conductors at the transformer.

3,663,866

BACK PLANE

Michael F. Iosue, Danielson, Conn.; Ronald F. Robinson, Wayne, Pa.; Paul L. Anderson, Rockville, and Edwin P. Ziobrowski, Putnam, both of Conn., assignors to Rogers Corporation, Rogers, Conn.

Filed Mar. 27, 1970, Ser. No. 23,170
Int. Cl. H05k 1/04
U.S. Cl. 317—101 CM 9 Claims



A back plane for use as a power bus which supports and electrically energizes microcircuit chips. The back plane is formed by a laminated structure in which are mounted wire wrap pins that form terminals for the microcircuits. The laminates are sheets of conductive material insulated from one another and the wrap pins are mounted in the laminated structure so that electrical contact for each pin is made with only one of the conductive laminates. There are sufficient wrap pins to provide electrical contact with each of the respective conductive laminates. The laminates also include channels in which microcircuit chips may be mounted. The leads from the chips can be wrapped around the terminal pins which are connected respectively to the laminates energized at appropriate voltage levels.

3,663,867

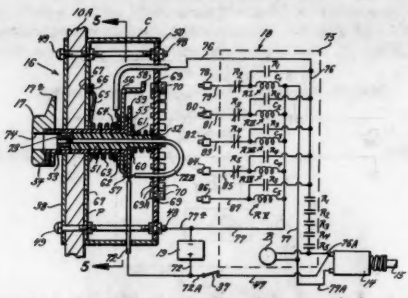
GENERAL PURPOSE PRESETTABLE ELECTRO-MECHANICAL COMBINATION SAFETY LOCK DEVICE

Louis P. Fister, 470 Lake Ave., St. Louis, Mo.

Filed Aug. 24, 1970, Ser. No. 66,330
Int. Cl. H01h 47/22
U.S. Cl. 317—134 6 Claims

A general purpose presettable electro-mechanical combination lock and safety device to replace locks on doors, safes and the like, and to prevent automobile thefts. The device comprises an electrically responsive lock or other electro-mechanical means which is commanded to operate by a preselected numerical combination of several digits in a sequential series through a presettable electronic circuit. The

operation of the lock or electro-mechanical means is controlled by a presettable command circuit and activated by a



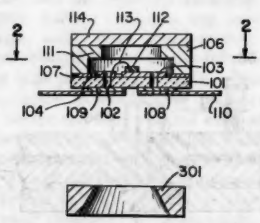
numerical selecting means or by a by-pass switch means, depending on the requirements of the protection desired.

3,663,868

HERMETICALLY SEALED SEMICONDUCTOR DEVICE

Shozo Noguchi, and Yoshiyuki Nanko, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1970, Ser. No. 81,464
Claims priority, application Japan, Oct. 17, 1969, 44/82769
Int. Cl. H01l *3/00, 5/0*
U.S. Cl. 317—234 R **6 Claims**



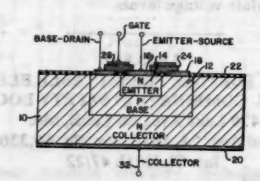
A hermetically sealed container for a semiconductor device or the like comprises a peripheral wall portion surrounding the semiconductor device and secured, such as by brazing, at its lower end to an insulating substrate. The upper section of the wall portion is thicker than its lower portion to thereby permit increased mechanical contact strength.

3,663,869

BIPOLAR-UNIPOLAR TRANSISTOR STRUCTURE

Gene Strull, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 26, 1971, Ser. No. 109,845
Int. Cl. H01l *15/00*
U.S. Cl. 317—235 **6 Claims**



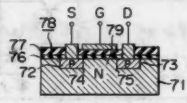
A unipolar-bipolar amplifying structure which combines the use of a photosensitive thin film unipolar transistor structure with a conventional single crystal bipolar structure whereby the bipolar transistor characteristics can be varied in response to changes in radiation incident on the unipolar thin film device.

3,663,870

SEMICONDUCTOR DEVICE PASSIVATED WITH RARE EARTH OXIDE LAYER

Tadashi Tsutsumi, Tokyo, and Takeshi Matsuo, Yokohama-shi, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Nov. 10, 1969, Ser. No. 875,223
Claims priority, application Japan, Nov. 13, 1968, 43/82578; Oct. 21, 1969, 44/83606
Int. Cl. H01l *3/00, 5/06, 7/58*
U.S. Cl. 317—235 R **10 Claims**



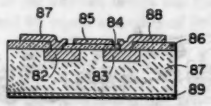
In a semiconductor device comprising a semiconductor substrate, at least one junction dividing the substrate into at least two regions to define an interface therebetween, the end of the junction being exposed on a surface of the substrate, and an insulating film covering the exposed end of the junction. At least a layer of the film consists essentially of one oxide of an element selected from the group of yttrium, scandium, europium, samarium, terbium, and dysprosium.

3,663,871

MIS-TYPE SEMICONDUCTOR READ ONLY MEMORY DEVICE AND METHOD OF MANUFACTURING THE SAME

Sho Nakanuma; Tohru Tsujide, and Toshio Wada, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 16, 1970, Ser. No. 11,426
Claims priority, application Japan, Feb. 18, 1969, 44/2020
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 R **2 Claims**



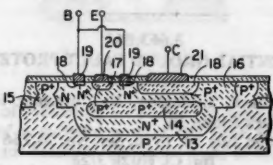
A metal-insulator-semiconductor (MIS) semiconductor read-only memory element employs, as the gate insulator film, an alumina film formed through a novel hydrolytic deposition process.

3,663,872

INTEGRATED CIRCUIT LATERAL TRANSISTOR

Takayuki Yanagawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1970, Ser. No. 3,773
Claims priority, application Japan, Jan. 22, 1969, 44/4928
Int. Cl. H01l *11/06*
U.S. Cl. 317—235 R **4 Claims**



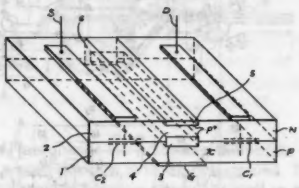
A lateral transistor serving as a minority transistor in an integrated circuit has a region buried in the base region and having an opposite conduction type to the base region.

3,663,873

FIELD EFFECT TRANSISTOR

Hajime Yagi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of application Ser. No. 580,752, Sept. 20, 1966, now abandoned. This application Jan. 27, 1969, Ser. No. 802,717
Claims priority, application Japan, Oct. 8, 1965, 40/61745
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 R 8 Claims



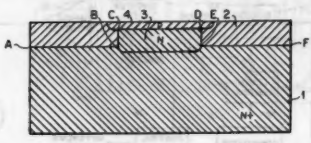
Field effect transistor and method of making same, the transistor having a high resistance layer of one conductivity type an epitaxially grown layer of the opposite conductivity type on the first layer, and a low resistance semiconductor layer formed between the two layers and extending partly into both layers, the low resistance layer being of the same conductivity type as the first-mentioned layer, with a channel between the low resistance layer and the second semiconductor layer.

3,663,874

IMPATT DIODE

Yukio Fukukawa, Tokyo, and Masaichi Shinoda, Sagamiharashi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 6, 1969, Ser. No. 864,015
Claims priority, application Japan, Oct. 17, 1968, 43/75978
Int. Cl. H01l *5/00*
U.S. Cl. 317—235 T 4 Claims



A high resistance semiconductor epitaxial layer of opposite conductivity type is provided on a lower resistance semiconductor substrate of one conductivity type. A first diffusion layer of the one conductivity type and of cylindrical configuration extends through the epitaxial layer from the substrate in a limited area. A second diffusion layer of the opposite conductivity type and of disc-like configuration extends from the outer surface of the first diffusion layer a limited distance into the first diffusion layer in a manner whereby the junction between the first and second diffusion layers is planar and is embedded in the diode and has a breakdown voltage which is lower than that of the junction between the substrate and the epitaxial layer. Avalanche breakdown occurs substantially at the junction between the first and second diffusion layers.

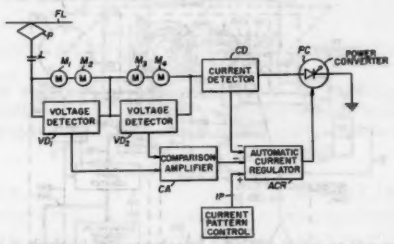
3,663,875

CONTROL SYSTEM FOR ELECTRIC VEHICLES

Masahiro Ashiya, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1970, Ser. No. 5,814
Claims priority, application Japan, Jan. 30, 1969, 44/6900
Int. Cl. H02p *5/50*
U.S. Cl. 318—52 3 Claims

Four DC traction motors are serially connected to one another and divided into two groups. Upon the occurrence of a slip, a difference between voltages across the two motor groups is detected and applied to a current regulator along with a current flowing through the motors and a current pattern for normally determining that current. Then a magnitude of current fed back to the motor current is determined and the motor current decreases until the slip terminates. After the slip has terminated, the normal operation is performed.



3,663,876

MOTOR CONTROL SYSTEM UTILIZING A HIGH INDUCTANCE CAPACITOR

Lyle E. McBride, Jr., Norton, and Daniel R. Pimentel, Seekonk, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 4, 1970, Ser. No. 86,660
Int. Cl. H02p *1/44*
U.S. Cl. 318—221 D 12 Claims

A control system is disclosed in which a selectively energizable load such as one or more motor windings are coupled to a source of power by a high inductance capacitor through a selectively energizable switch means. The capacitor is arranged such that it has a relatively significant value of resistance or inductance sufficient to limit the rate of energy transfer therethrough and hence through the switch means upon charging and discharging so as to protect the switch means against potentially adverse affects of high rates of energy transfer therethrough.

3,663,877

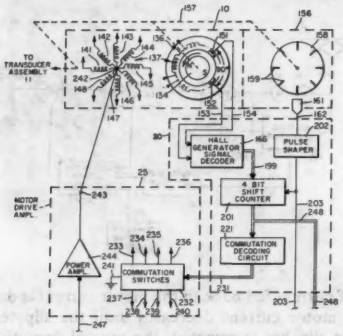
BRUSHLESS DC MOTOR INCLUDING TACHOMETER COMMUTATION CIRCUIT

Harold V. Clark, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1970, Ser. No. 25,054
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 7 Claims

A DC motor formed of a stationary segmented armature winding and a two pole permanent magnet rotor, wherein a pair of Hall effect generators are mounted 90° apart within the armature winding to develop a pair of quadrature related sinusoidal signals and wherein a tachometer is disposed to generate a plurality of pulses for each revolution of the rotor. Commutation for the armature windings is achieved by an electronic switching circuit connected to receive the Hall generator signals and the tachometer pulse signal and

respond to the phase relationships between these various signals to develop multiple phase switching signals in which the phase angles thereof are precisely correlated to the angle of rotation of the rotor. The motor is illustrated in the environment of a servo controlled magnetic tape transport, wherein the commutation signals or switching signals associated therewith serve as multi-phase tachometer or angular position indicating signals in a special servo controlled operation.

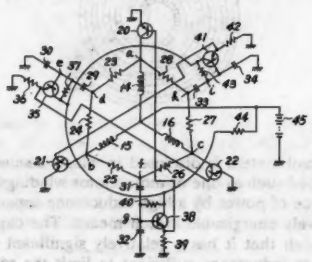


3,663,878

DIRECT CURRENT MOTOR COMMUTATION SYSTEM RESPONSIVE TO C.E.M.F.

Takao Miyasaka, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa-ku, Yokohama, Kanagawa-ken, Japan

Filed Aug. 26, 1970, Ser. No. 66,911
Claims priority, application Japan, Aug. 28, 1969, 44/67577
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 **7 Claims**



A commutatorless type direct current (DC) motor which has a rotor made of permanent magnet. Stator windings are sequentially passed with a current of constant phase rotation and thereby the rotor is initiated to rotate. After starting, counter electromotive forces induced in the stator windings are used for detecting the rotation angle of the rotor. Adequate currents are thereby made to flow in the stator windings and a steady rotation of the rotor is continuously performed.

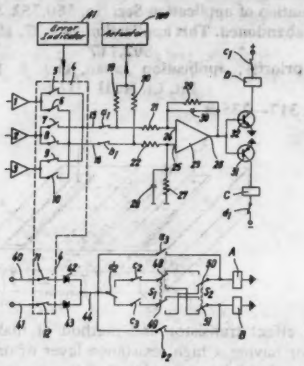
3,663,879

CIRCUIT FOR DETERMINING DEFECTIVE CONTROL CIRCUITS IN A PLURAL CIRCUIT FLIGHT CONTROL SYSTEM

Wolfgang Salamon, and Werner Fath, both of Bremen, Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

Filed Aug. 18, 1970, Ser. No. 64,750
Int. Cl. G05b *9/02*
U.S. Cl. 318—564 **9 Claims**

In a flight control redundancy system for aircraft, any two control circuits that remained operative after dropout or others, are connected to provide sum and difference of their outputs, the sum to provide actuator control, the difference to detect any error in the operation of one of the two circuits. In case of such error, resulting reaction together with polarity of error detection is used to select the faulty one and disconnect same from the system, so that actuation control is provided by the remaining circuit alone.

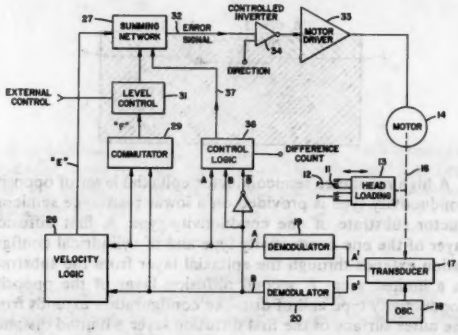


3,663,880

APPARATUS FOR CONTROLLING THE RELATIVE POSITION BETWEEN TWO RELATIVELY MOVABLE MEMBERS

Andrew Gabor, Danville, Calif., assignor to Diablo Systems, Inc., Hayward, Calif.

Filed Sept. 14, 1970, Ser. No. 71,894
Int. Cl. G05b *1/01*
U.S. Cl. 318—603 **11 Claims**



Apparatus for bringing the read/write heads of a magnetic disk unit to a stop over a predetermined track where quadrature position signals are utilized to provide a symmetrical logic signal which in conjunction with a difference count provides the coincidence indication of the stopping point.

3,663,881

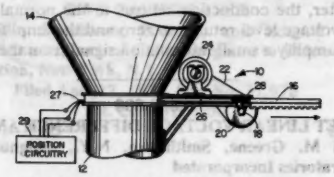
CONTINUOUS POSITION SENSING SYSTEM

Albert D. Ehrenfried, Concord; John Niejadlik, Littleton, and Norton T. Pierce, Concord, all of Mass., assignors to Metritape, Inc., West Concord, Mass.

Filed Dec. 12, 1969, Ser. No. 884,598
Int. Cl. G05b *1/06*
U.S. Cl. 318—663 **24 Claims**

A system for the precise and spatially-continuous determination of position along a predetermined path, capable of

efficient operation even over relatively large distances. The system employs a unique elongated sensor capable of providing a signal directly related to the position of an actuating force applied thereto. The tape sensor is positioned along a



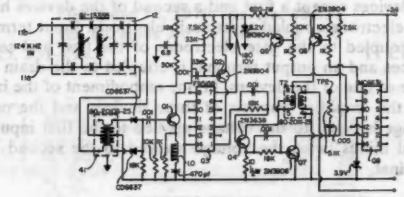
path of travel, and means for actuating the sensor is coupled to an object whose position is to be determined. The system is operative to provide position control as well as position indication and can be adapted to provide self-monitoring during system operation.

3,663,882

HARMONIC GENERATOR

William Henry Euchner, San Carlos, Calif., assignor to Farinon Electric, San Carlos, Calif.

Filed July 13, 1970, Ser. No. 54,093
Int. Cl. H03k *5/08*
U.S. Cl. 328—33 **2 Claims**



A harmonic generator in which a sinewave input signal drives a pulse generator whose output is applied to the mid-point of the primary of a transformer. Switching means are connected to opposite ends of the primary and operate such that unipolar pulses applied to the mid-point flow alternately in opposite halves of the transformer. The output from the secondary of the transformer is a bipolar pulse train having a high odd harmonic content.

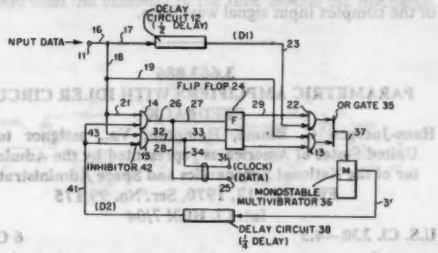
3,663,883

DISCRIMINATOR CIRCUIT FOR RECORDED MODULATED BINARY DATA SIGNALS

Mitsuo Oiso, Yokohama-shi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 28, 1969, Ser. No. 880,560
Claims priority, application Japan, Dec. 4, 1968, 43/88785
Int. Cl. H03k *17/28*
U.S. Cl. 328—72 **6 Claims**

A discriminator circuit discriminates recorded modulated binary data signals represented in accordance with whether a clock pulse is present in the interval between bits and a pulse is simultaneously present at the center of a bit. The discriminator circuit derives a data window signal for separating clock pulses and data pulses from the input data in a manner whereby when a pulse is absent from the center of a preceding bit the data window signal is derived in accordance with a pulse present in the interval between bits and when a pulse is present at the center of a preceding bit the data window



signal is derived in accordance with the pulse at the preceding bit.

3,663,884

FREQUENCY DIFFERENCE DETECTOR

Tamas I. Pattantyus, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 24, 1969, Ser. No. 869,268
Int. Cl. H03b *3/04*
U.S. Cl. 328—134 **5 Claims**

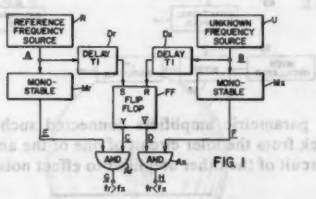


FIG. 1

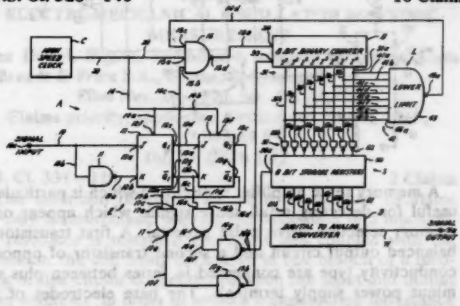
A system for detecting a frequency difference between a known reference frequency and an unknown frequency wherein both frequencies are delayed and respectively applied to a bistable element whose output state is utilized to control respectively a pair of AND logic elements which also receive signals as inputs respectively in response to the undelayed frequencies, an output from either of the AND elements being indicative that a frequency difference exists and the direction of the difference.

3,663,885

FAMILY OF FREQUENCY TO AMPLITUDE CONVERTERS

Carrington H. Stewart, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Apr. 16, 1971, Ser. No. 134,573
Int. Cl. H03k *5/20*
U.S. Cl. 328—140 **10 Claims**



A family of frequency to amplitude converters is disclosed which convert an incoming signal of a complex waveform

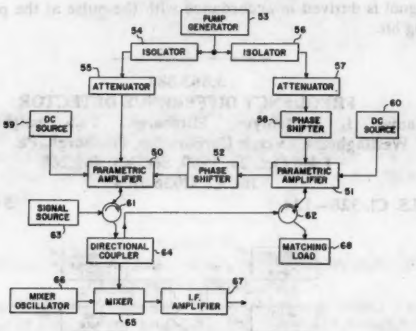
and unknown frequency into an output signal corresponding in amplitude to the unknown frequency of the input signal thereby permitting accurate determination of the frequency of the complex input signal waveform.

3,663,886

PARAMETRIC AMPLIFIERS WITH IDLER CIRCUIT FEEDBACK

Hans-Juergen C. Blume, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 17, 1970, Ser. No. 99,175
Int. Cl. H03f 7/04
U.S. Cl. 330—4.5 **6 Claims**



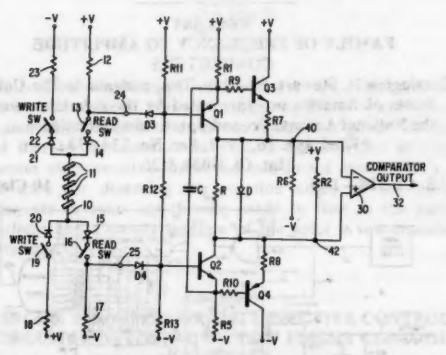
Two parametric amplifiers connected such that there is feedback from the idler circuit of one of the amplifiers to the idler circuit of the other amplifier to effect noise reduction.

3,663,887

MEMORY SENSE AMPLIFIER INHERENTLY TOLERANT OF LARGE INPUT DISTURBANCES

Westley Vayne Dix, Wellesley Hills, Mass., assignor to RCA Corporation

Filed Aug. 14, 1970, Ser. No. 63,757
Int. Cl. H03f 3/18
U.S. Cl. 330—13 **3 Claims**



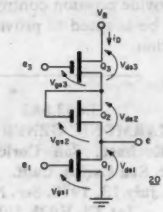
A memory sense amplifier is disclosed which is particularly useful for detecting small sense signals which appear on a memory selection drive pulse pedestal. A first transistor, a balanced output circuit and a second transistor of opposite conductivity type are connected in series between plus and minus power supply terminals. The base electrodes of the transistors are coupled to respective opposite ends of the memory line, which are normally at plus and minus power supply voltages. The balanced output terminals are normally at ground potential. A memory drive pulse which causes the transistor base voltages to go toward ground results in a surge of current from a capacitor connected between the transistor emitters. The output circuit includes a diode poled to conduct the current surge and limit the output voltage. Thereafter, the conduction returns to the normal value, the output voltage level returns to zero and the amplifier is ready to fully amplify a small information signal from the memory.

3,663,888

ALL-FET LINEAR VOLTAGE DIFFERENCE AMPLIFIER

Richard M. Greene, Smithtown, N.Y., assignor to GTE Laboratories Incorporated

Filed Feb. 16, 1970, Ser. No. 11,598
Int. Cl. H03f 3/16
U.S. Cl. 330—18 **6 Claims**



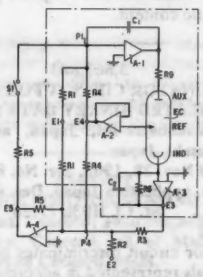
A linear voltage difference amplifier circuit which utilizes a plurality of field-effect devices having substantially identical operating characteristics. The devices are connected in a series arrangement with the source electrode of each device coupled to the drain electrode of its adjacent device. Each of the devices except a first and a second of the devices has its gate electrode coupled to its drain electrode. Input terminals are coupled to the gate electrodes of the first and second devices and an output terminal is coupled to the drain electrode of one of the devices. In one embodiment of the invention the amplifier consists of three devices and the output voltage is equal to the voltage applied to the first input terminal minus twice the voltage applied to the second input terminal.

3,663,889

COMBINATION CURRENT CONTROL - VOLTAGE CONTROL CIRCUIT

Stanley Bruckenstein, Amherst, N.Y., and Barry Miller, Murray Hill, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 30, 1970, Ser. No. 23,851
Int. Cl. H03f 1/36
U.S. Cl. 330—102 **2 Claims**



A single control amplifier in combination with two loop control paths, one of which includes a switch, provides selec-

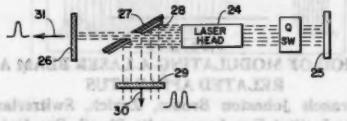
tively for establishing a preselected voltage or a preselected current without distorting the output by either limiting or transients. Operation of the switch allows shifting between the voltage control mode and the current control mode.

3,663,890

TWO CAVITY LASER

Carl William Schulthess, Pomona, and Eduard Gregor, Pacific Palisades, both of Calif., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 27, 1970, Ser. No. 31,978
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **8 Claims**



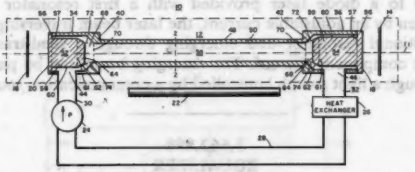
A laser system includes a single laser material with means defining a first optical cavity for producing regeneration of radiation of a first oscillating mode and additional means defining a second optical cavity for the same laser material providing regeneration of radiation of a second oscillating mode. By this arrangement, distinct first and second output beams of different mode oscillations and of the same frequency are provided from a single laser material.

3,663,891

CELL FOR USE IN A CIRCULATING LIQUID LASER

Robert C. Kocher, Great Neck, and Harold Samelson, Sea Cliff, both of N.Y., assignors to GTE Laboratories Incorporated

Filed June 12, 1970, Ser. No. 45,821
Int. Cl. H01s *3/05, 1/04;* G01n *1/10*
U.S. Cl. 331—94.5 **11 Claims**



A cell for use in a circulating liquid laser comprising an elongated cylindrical active region and an input and an output chamber mounted coaxially at opposite ends of the active region. A window is positioned coaxially in each chamber. Liquid active material entering the input chamber flows around the window so that large scale disturbances which may exist in the entering liquid are smoothed prior to the liquid entering the active region.

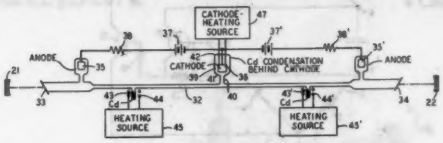
3,663,892

METAL ION LASER HAVING AN AUXILIARY GAS

Marvin Bertrand Klein, Long Beach, and Thomas Patrick Sosnowski, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 15, 1970, Ser. No. 46,097
Int. Cl. H01s *1/06, 3/09*
U.S. Cl. 331—94.5 **10 Claims**

There are disclosed cadmium ion lasers in which gettering of helium by cadmium deposited on walls near the discharge is counteracted by maintaining the coolest region frequented by cadmium ions above about 100° C, although preferably about 150° C, and away from the discharge. One embodiment employs a tube having an enlarged region or sidearm to remove the coolest region from the discharge. A preferred embodiment disposes the cathode in a housing of larger diameter than the diameter of the tube around the discharge,



the cathode being at a position in the housing establishing a variation in wall temperature to compel the spent cadmium to be deposited behind the cathode with respect to the discharge.

3,663,893

HIGH-EFFICIENCY DIODE-PUMPED LASERS

Frederick William Ostermayer, Jr., New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 13, 1970, Ser. No. 54,538
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 **2 Claims**

Certain practical difficulties are encountered in positioning a pump source comprising very-small-diameter electroluminescent diodes in direct physical contact with an associated laser rod. These difficulties are surmounted by positioning the diodes and the rod in a spaced-apart relationship and imaging the emitting areas of the diodes to positions slightly within the rod. In addition, a major portion of the surface of the rod is coated with a reflective material whereby radiation that enters the rod is multiply reflected therein. In this way the radiant output of the diodes is coupled to the rod in a highly efficient manner by means of a structure that is easily realized.

3,663,894

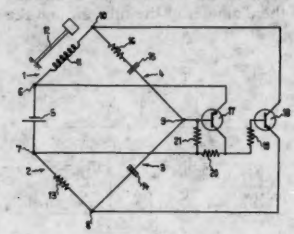
ELECTROMECHANICAL OSCILLATOR FOR TIME MEASUREMENT

Max Hetzel, Bienne, Switzerland, assignor to Omega Louis Brandt & Frere S.A., Bienne, Switzerland

Filed Nov. 20, 1970, Ser. No. 91,321
Claims priority, application Switzerland, Dec. 2, 1969, 17,902/69
Int. Cl. H03b *5/42*
U.S. Cl. 331—110 **2 Claims**

This invention relates to an electromechanical oscillator for time measurement, wherein the oscillation of a mechanical resonator is sustained through a coil coupled with the resonator, the coil being connected in one branch of a feedback bridge circuit connected between the input and output of an amplifier. In order to avoid a compensating inductance for said coil a specific network of resistors and condensers is

provided including a compensating resistance for the ohmic component of the coil impedance and a supplemental re-



sistance for compensation of the inductive component of the coil impedance.

3,663,895

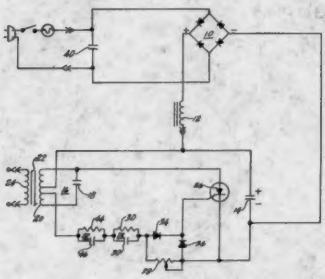
FREE RUNNING L-C OSCILLATOR USING SILICON-CONTROLLED RECTIFIER

Jerome S. Hochheiser, Northridge; Louis Zermeno, Los Angeles, and Galen Sitler, Duarte, all of Calif., assignors to Hochheiser Eectronics Corporation, Burbank, Calif.

Filed Nov. 12, 1970, Ser. No. 88,871

Int. Cl. H03b *5/12, 11/00*

U.S. Cl. 331—117 R **5 Claims**



There is described an oscillator circuit utilizing a tank circuit and a silicon-controlled rectifier connecting a portion of the tank circuit across a DC potential source. The gate electrode of the silicon-controlled rectifier is controlled from a voltage taken off the tank circuit through a delay network to provide the correct phase relationship between the triggering of the silicon-controlled rectifier and the voltage across the tank circuit.

3,663,896

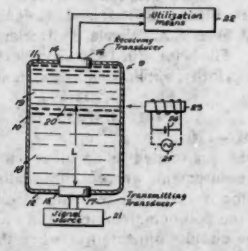
FERROFLUID ULTRASONIC SIGNAL MODULATOR

Jack G. Parks, Troy, Mich., assignor to The United States of America as represented by the Secretary of the Army

Filed Aug. 17, 1970, Ser. No. 64,425

Int. Cl. H03c *1/08*

U.S. Cl. 332—51 M **5 Claims**



A ferrofluid ultrasonic signal modulator consisting of a closed hollow member having a transmitting transducer affixed in one end and a receiving transducer affixed in an opposite end. The closed member forms an interferometer chamber in which are placed two immiscible liquids. One of the liquids is a ferrofluid adjacent the receiving transducer and partially filling the chamber and the other is a liquid possessing low attenuation for the ultrasonic waves, filling the remainder of the chamber and in contact with the transmitting transducer. When a magnetic field is applied to the interface formed by the two liquids the path length through the said other liquid between the transmitting transducer and the interface is changed due to distortions produced in the ferrofluid by the magnetic field. This change shifts the resonance spike position in the frequency domain resulting in amplitude modulation of the ultrasonic signal transmitted through the chamber.

3,663,897

METHOD OF MODULATING A LASER BEAM AND RELATED APPARATUS

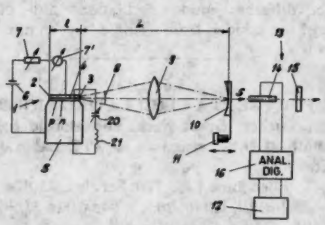
Ronald Francis Johnston Broom, Zurich, Switzerland, assignor to Institut Fur Angewandte Physik Der Universitat Bern, Bern, Switzerland

Filed Feb. 6, 1970, Ser. No. 9,368

Claims priority, application Switzerland, June 6, 1969, 1841/69

Int. Cl. H01s *3/18, 3/12*

U.S. Cl. 332—7.51 **11 Claims**



A laser technique by which an additional resonator is coupled to a diode laser provided with a first resonator and driven by an adjustable current, the laser beam traversing the additional resonator and emerging through a semi-translucent component thereof. The emerging beam can be passed through a light switch controlled by a communication source.

3,663,898

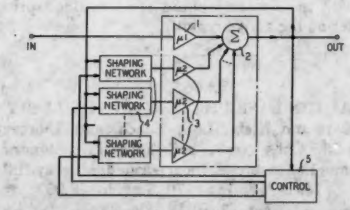
EQUALIZER

Chih-Yu Kao, Lawrence, and Carl F. Kurth, Andover, both of Mass., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1969, Ser. No. 885,798

Int. Cl. H04b *3/14*

U.S. Cl. 333—18 **2 Claims**



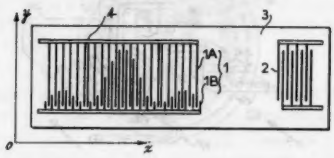
A multibump equalizer having a main path which comprises an amplifier and a summing network and a plurality of feedback paths each including an individual amplifier and shaping network connected from the output of the equalizer to individual inputs to the summing network. All amplifiers and the summing network can be realized with a single operational amplifier.

3,663,899

SURFACE-WAVE ELECTRO-ACOUSTIC FILTER

Eugene Dieulesaint, and Pierre Hartemann, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 2, 1970, Ser. No. 25,158
Claims priority, application France, Apr. 16, 1969, 6911765
Int. Cl. H03h 9/02, 9/32
U.S. Cl. 333—70 T 12 Claims



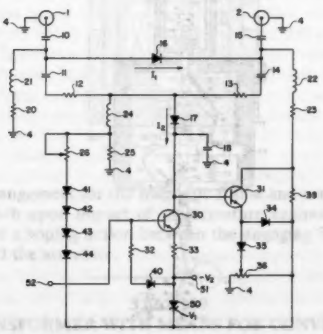
An electro-acoustic surface-wave (Rayleigh waves) device comprises a piezoelectric plate equipped with two transducers one at least of which is constituted by two comb-shaped electrodes having interleaved teeth. At least one of the electrodes have teeth of a dissimilar length the envelope of which is the curve representing the Fourier transform of the transfer function of the device when operated as a filter. The device finds application in the fields of radar, telecommunications, data processing, and the like.

3,663,900

VOLTAGE CONTROLLED ATTENUATOR

Olav Peterson, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Feb. 16, 1971, Ser. No. 115,622
Int. Cl. H01p 1/22
U.S. Cl. 333—81 R 6 Claims



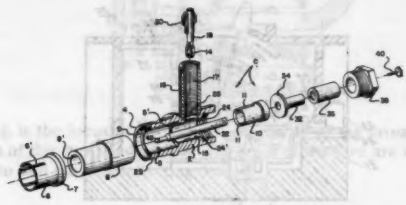
The circuit controls two direct currents in two PIN diodes of an attenuator so that the product of the two currents is constant. In the circuit, an emitter-follower controls the direct current in one PIN diode in proportion to a control voltage. The direct current in the other PIN diode is controlled as dictated by the response curve of a transistor, the emitter of which is in series with a diode, in approximate proportion to the reciprocal of the voltage being developed across the one PIN diode. A bridged-T attenuator is thus controllable from a single control voltage source so that it exhibits a constant image impedance over a wide range of insertion loss.

3,663,901

TUNED COAXIAL DEVICE

Edgar Wilmot Forney, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 27, 1970, Ser. No. 15,168
Int. Cl. H01p 5/04; H01r 11/02, 17/18
U.S. Cl. 333—97 R 4 Claims



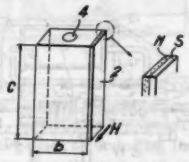
The disclosure relates to a tuner device in a coaxial connector to readily adjust VSWR of an RF system by a structure which is of improved sensitivity and is practical and usable in the field.

3,663,902

METHOD FOR MODIFYING THE CHARACTERISTICS OF A MICROWAVE AND DEVICE FOR THE APPLICATION OF SAID METHOD

Guy Deutscher, 6, Square Charles Laurent, Paris 15e, and Georges Waysand, 172, Rue R. Losserand, Paris XIV, both of France

Filed Feb. 22, 1971, Ser. No. 117,463
Claims priority, application France, Feb. 27, 1970, 7007133
Int. Cl. H01v 11/12; H01p 7/06, 9/00
U.S. Cl. 333—99 S 10 Claims



In a microwave structure, a magnetic field is applied in a direction parallel to one or more elements consisting of two superposed metallic layers which are in good electrical contact and one of which is superconducting. The magnetic field intensity is varied in order to modify the thickness of the zone of superconductivity which is induced in the non-superconducting metallic film-layer and consequently in order to modify the depth of penetration of the microwave in the element.

3,663,903

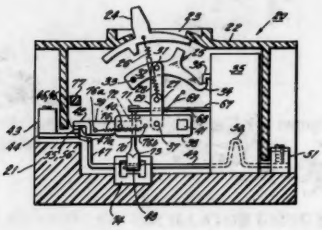
TRIPPING SYSTEM FOR CIRCUIT BREAKER

Frank W. Kussy, Haverford, and Gustave E. Heberlein, Jr., King of Prussia, both of Pa., assignors to ITE Imperial Corporation, Philadelphia, Pa.

Filed May 20, 1971, Ser. No. 145,175
Int. Cl. H01h 77/10
U.S. Cl. 335—16 16 Claims

A current limiting circuit breaker is constructed to achieve more rapid tripping in the medium fault current range by utilizing a magnetic tripping device which imparts physical motion to the movable contact under particular fault current conditions. In the lowest fault current range above the thermal tripping range the magnetic tripping unit automatically

operates or releases the spring operating mechanism thereby causing contact separation. As fault current increases the magnetic tripping means is effective to assist the operating mechanism to physically move the movable contact, and at still higher currents the magnetic tripping means moves the movable contact to its fully open position before any movement is imparted to the movable contact by the spring



operating mechanism. As fault currents increase still further, electrodynamic forces assist the magnetic means to physically move the movable contacts, and in the very highest fault current range electrodynamic operation moves the movable contact essentially to its fully opened position, before the magnetic trip means for the operating mechanism is active in moving the movable contact.

3,663,904

ELECTRO-MECHANICAL CONTROL APPARATUS

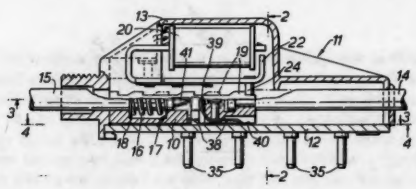
Alec John Heap, Burnley, England, assignor to Joseph Lucas Industries Limited, Birmingham, England

Filed Nov. 23, 1970, Ser. No. 92,042

Claims priority, application Great Britain, Dec. 18, 1969, 61,642/69

Int. Cl. H01h *51/10*

U.S. Cl. 335—138 **7 Claims**



An apparatus for providing step-by-step movement has a block which is urged by an external bias to slide within a body. The block has two rows of staggered projections which are respectively engageable by a pair of electromagnetically operated latches. The block co-operates with the body to provide a sequential switching arrangement for the latches alternately, whereby operation of one latch allows the block to move to a position at which the switching arrangement operates the next latch. Means is provided for over-riding the stepping action of the apparatus.

3,663,905

CONTACT BRIDGE SYSTEM FOR CIRCUIT BREAKER

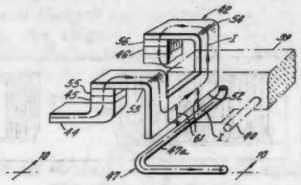
Frank W. Kussy, Haverford, and Gustave E. Heberlein, Jr., King of Prussia, both of Pa., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed May 20, 1971, Ser. No. 145,176

Int. Cl. H01h *77/10*

U.S. Cl. 335—195 **11 Claims**

A circuit breaker bridging contact is constructed as a U-shaped member having L-shaped arms to more efficiently utilize electrodynamic forces to achieve current limiting action. Upon circuit opening parallel arcs re drawn between the bridging contacts and the spaced stationary contacts. The currents flowing in these arcs are in directions opposite to current flowing in those portions of the bridging contact arms that are parallel to the arcs and relatively close thereto, so that electrodynamic forces tend to drive the arcs away from



the separating contacts. Speed of contact separation is improved by having the web of the bridging contact in close proximity and parallel to a rigidly held conductor section through which current flows in a direction opposite to that of current flowing through the bridging contact web.

3,663,906

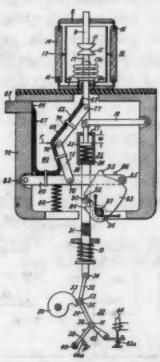
ELECTRIC CIRCUIT BREAKER WITH MAGNETICALLY ASSISTED CLOSING MEANS

Philip Barkan, and Klaus M. Skreiner, both of Media, Pa., assignors to General Electric Company

Filed Oct. 9, 1969, Ser. No. 865,046

Int. Cl. H01h *3/42*

U.S. Cl. 335—195 **16 Claims**



An electric circuit breaker containing electromagnetic-assist means for opposing the contact-repulsion forces developed when a high current flows through the breaker. The electromagnetic-assist means comprises a rigid support member which when restrained in a fixed position renders the assist means capable of transmitting closing force to the movable contact but which, when released, disable the assist means. Releasable latching means restrains the support member in said fixed position when the contacts are engaged. This latching means is controlled by the motion of a contact-operating member that is coupled to the movable contact through a suitable wipe mechanism.

3,663,907

BEAM CONVERGENCE EXCITER FOR SHADOW MASK COLOR PICTURE TUBE

William Henry Barkow, Pennsauken, N.J., assignor to RCA Corporation

Filed Dec. 8, 1970, Ser. No. 96,003
Int. Cl. H01f 3/12
U.S. Cl. 335—211 5 Claims

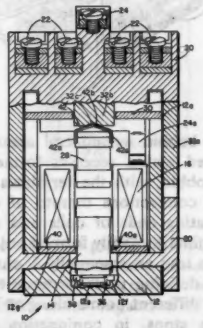
The exciter, mounted closely behind the deflection yoke on the neck of the tube, has three pairs of external coils which are respectively associated with three pairs of internal pole pieces and are enveloped by a ferromagnetic core.

3,663,908

RELAY MAGNETIC FRAME AND ARMATURE ARRANGEMENT

Hugh Kane, and George W. Richardson, both of Freeport, Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 11, 1970, Ser. No. 71,457
Int. Cl. H01f 7/08
U.S. Cl. 335—271 7 Claims



An arrangement for the magnetic frame and armature of a relay which upon impact of the armature against the frame allows for a wiping action between the engaging faces of the frame and the armature.

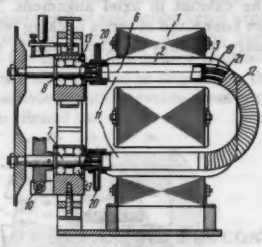
3,663,909

TRANSFORMER WITH MEANS FOR CONVEYING ELECTRIC ENERGY TO ROTARY CURRENT-COLLECTING DEVICES

Igor Vladimirovich Pentegov, Zadorozhny Pereulok, 6, kv. 14; Stephan Ivanovich Semergeev, ulitsa Filatova, I/22, kv. 13; Sheikovsky, Dmitry Alexeevich, ulitsa Anri Barbjusa, 5a, kv. 22; Sergei Nikolaevich Mescheryak, ulitsa Yanvarskogo Vasstonia, 17a, kv. 6; Evgeny Petrovich Stemkovsky, ulitsa Brigadirskaya, 27, kv. I; Leonid Vladimirovich Litvin, ulitsa Vernadskago, 61, kv. 3, and Nikolai Antonovich Sheiest, ulitsa Uritskogo, 39, kv. 78, all of Kiev, U.S.S.R.

Filed Mar. 2, 1971, Ser. No. 120,194
Claims priority, application U.S.S.R., Mar. 6, 1970, 140745
Int. Cl. H01f 17/06
U.S. Cl. 336—55 7 Claims

A transformer with means for conveying electric energy to rotary current-collecting devices, having a stationary core carrying a primary winding and at least one secondary winding having at least one turn free to rotate about a curved axis



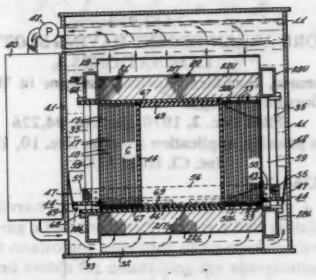
which is the locus of the centers of gravity of the cross-sections of this turn, and wherein the leads of the turn are made fast to said current-collecting devices.

3,663,910

SHUNT REACTOR HAVING IMPROVED INSULATING FLUID CIRCULATING MEANS

Robert L. Grubb, New Berlin, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed May 25, 1970, Ser. No. 40,016
Int. Cl. H01f 27/08
U.S. Cl. 336—57 16 Claims



A shunt reactor immersed in oil within a rectangular casing has cylindrical coils with vertical axes aligned in a common plane and a closed rectangular magnetic shield having laminations in vertical planes surrounding the coils. Annular washers with apertures therethrough and radial spacers on each surface are disposed between the ends of the coils and the magnetic shield and form radial ducts communicating with vertical cooling ducts in the coils. Barrier means form a closed chamber at the bottom of the casing and block flow of oil in paths which bypass the coils and shield and force increased flow of oil into the radial ducts and through the vertical ducts in the coils, and such barrier means include angle collars surrounding the lower end of each coil, baffle members which at one end overlap the angle collars and at the other end project horizontally outward, and flexible elongated steel members affixed to the casing sidewalls which extend inwardly and downwardly of the casing and interfere with and are pushed outwardly by the horizontal baffle member when the reactor is lowered into the casing, thereby forming dams preventing upward movement of oil along the casing sidewalls.

3,663,911

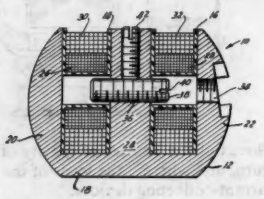
VARIABLE SCALE DIFFERENTIAL TRANSFORMER

Jacob Chass, Forest Hills, N.Y., assignor to Pickering & Company, Inc., Plainview, L. I., N.Y.

Filed Apr. 22, 1971, Ser. No. 136,390
Int. Cl. H01f 21/06
U.S. Cl. 336—132 6 Claims

A variable scale differentiator transformer is provided, including a yoke of magnetic material having two cavities

therein. First and second nonmagnetic bobbins, each carrying a primary and secondary winding thereabout are provided in the cavities in axial alignment. The two primary windings are connected in series bucking relationship and the two secondary windings are connected in series aiding relationship. A bore, coaxial with the bobbin, extends through the portion of the yoke separating the cavities and an elongated magnetic core is provided in the bore. Means are also provided for longitudinally adjusting the position of the core to vary the length of the portions of the core extending into each of the cavities.



3,663,912

CORE ARRANGEMENT HAVING SLOTTED LAMINATIONS

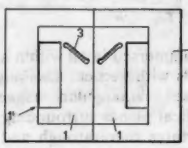
Ernst Wiesner, Dornbirn, Austria, assignor to Walter Zumtobel, Dornbirn, Austria

Filed Dec. 2, 1970, Ser. No. 94,226

Claims priority, application Austria, Dec. 10, 1969, 476

Int. Cl. H01f *17/06*

U.S. Cl. 336—178 **9 Claims**



The core laminations of an inductor or transformer are slotted at an angle of 45° to the direction of magnetic flux, the ends of the slots being spaced from edges of the laminations extending in that direction. When two slots are provided, they form a chevron pattern symmetrical relative to a plane extending in that direction, and the laminations may be split in that plane. The slots are wider than the laminations are thick and have approximately circularly enlarged ends.

3,663,913

CORE COIL HAVING A IMPROVED TEMPERATURE CHARACTERISTIC

Umaki Kato, and Hisao Nishino, both of Yokohama, Japan, assignors to Tohoku Metal Industries Limited, Yokohama-shi, Japan

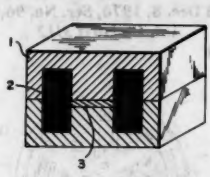
Continuation-in-part of application Ser. No. 786,080, Dec. 23, 1968, now abandoned. This application Feb. 2, 1970, Ser. No. 8,042

Claims priority, application Japan, Dec. 22, 1967, 42/82091

Int. Cl. H01f *15/16*

U.S. Cl. 336—179 **8 Claims**

The temperature characteristics of a core and winding assemblage are improved by including within the magnetic circuit of the core an auxiliary core which is composed of a mixture of magnetic powders of various Curie points,



whereby the inductance of the core assemblage remains constant over a wide range of temperature.

3,663,914

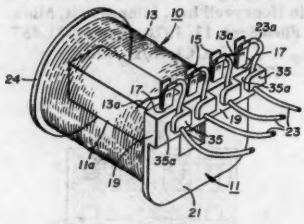
BOBBIN WOUND COIL ASSEMBLY AND ELECTRICAL TERMINALS THEREFOR

Homer P. Lane, Indianapolis, Ind., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed June 14, 1971, Ser. No. 152,877

Int. Cl. H01f *15/10*

U.S. Cl. 336—192 **9 Claims**



An electrical bobbin wound coil assembly has electrical terminals secured within recesses formed in at least one flange of the bobbin, with the terminals being adapted for making welded connections thereto of either insulated or stripped terminating ends of coils and associated external leads. Each terminal is readily formed out of strip stock, bent at a sharp angle into an essentially V-shaped configuration, and has a stop-defining protruberance and a stop-defining bend formed at different points along at least one leg of the terminal. These stops, in conjunction with the inherent spring-bias clamping action of the legs of the terminal, temporarily position and hold the coil and lead ends at different desired elevations prior to their being permanently secured, preferably by welding, to the terminal. An L-shaped slot, associated with each terminal, extends outwardly from and is integral with a flange of the bobbin. The slot provides a means to firmly anchor an external lead to the bobbin in a manner which protects the lead-terminal connection from deleterious stresses which could otherwise be encountered during assembly, handling or use.

3,663,915

ELECTRIC CARTRIDGE FUSES WITH BLOWN FUSE INDICATOR

Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Dec. 15, 1970, Ser. No. 98,423

Int. Cl. H01h *85/30*

U.S. Cl. 337—244 **3 Claims**

A cartridge fuse provided with a blown fuse indicator arranged in coaxial relation with the casing of the fuse and forming an integral part of the fuse. The blown fuse indicator includes an indicator housing arranged in coaxial relation to

the casing of the fuse and defining a shoulder abutting against the end surface of one of the pair of terminal caps by which the casing of the fuse is closed. The indicator housing

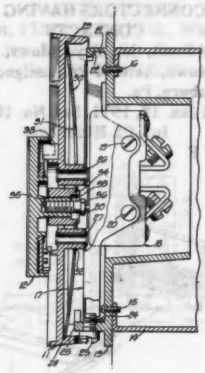
has a sleeve-like extension overlapping the lateral surface of one of said pair of terminal caps and affixed to said one of said pair of terminal caps.

3,663,916

SENSITIVE HIGH CAPACITY ROOM THERMOSTAT

Roland D. Beck, La Crescenta, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 2, 1968, Ser. No. 749,715
Int. Cl. H01h 37/12, 37/22, 37/46
U.S. Cl. 337—396 **5 Claims**



The invention comprises a plastic face plate which senses ambient temperature and operates a metal amplifier plate which bows outwardly of the face plate to actuate a thermostat switch. The differential expansion of the two plates causes the switch actuation.

3,663,917

DISPOSABLE TEMPERATURE-SENSING DEVICE

Parviz Mahmoodi, White Bear, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 7, 1970, Ser. No. 1,248
Int. Cl. G01k 7/22
U.S. Cl. 338—28 **4 Claims**

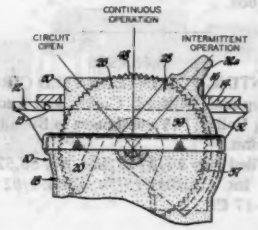
A temperature-sensing device comprising generally an elongated temperature-sensing probe having a thermistor on one end, means on the opposite end of the probe for connecting it with the temperature metering device, an impervious disposable sheath comprising a low thermal-conducting, elongated sleeve having a high thermal-conducting metal tip sealing one end thereof adapted to intimately receive the thermistor-containing probe, and means for removably holding said sheath on said probe. When the device is to be used, the sheath is placed over the probe and held thereon, the thermistor-containing end of said probe being urged into intimate contact with the metal tip, allowing rapid thermal transfer between the temperature source and the thermistor so that temperature may be read in degrees on the metering device. The disposable sheath prevents cross-contamination among patients in clinical use.

3,663,918

WINDSHIELD WIPER AND WASHER CONTROL SYSTEM

Clark Lincoln, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 12, 1971, Ser. No. 142,604
Int. Cl. H01c 1/16
U.S. Cl. 338—200 **3 Claims**



In a preferred form, this disclosure relates to a switch assembly having a housing which carries a first switch means or rheostat for controlling operation of an electric circuit means and a second switch for controlling the energization of other electric circuits. The first switch has a manually manipulatable first actuator supported thereon for movement in opposite directions and which is disposed in an opening of the housing. The second switch includes a manually manipulatable second actuator which is rotatably supported by the housing for movement in opposite directions between circuit open and circuit closed positions and which projects through the opening of the housing. The second actuator includes a cover portion which covers the first actuator when the second actuator is in the circuit open position and which progressively exposes the first actuator when it is moved from its circuit open position toward its circuit closed position to permit manual manipulation of the first actuator only when the second actuator has been moved to the circuit closed position.

3,663,919

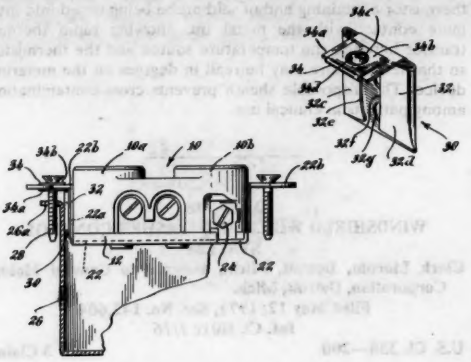
GROUNDING SPRING FOR ELECTRICAL FIXTURES

Frank C. Jaconette, Trumbull, Conn., assignor to Harvey Hubbell Incorporated, Bridgeport, Conn.

Filed June 16, 1970, Ser. No. 46,606
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R **10 Claims**

A substantially L-shaped grounding member having a resilient main body, is affixed to the forwardly extending end arm of a substantially U-shaped metallic mounting yoke of an electrical fixture adapted to be mounted in a grounded standard metal outlet box. The resilient main body of the grounding member is operative to be wedgedly clamped between

the end arm of the yoke and a juxtaposed portion of the metal box to thereby provide a direct and low resistance



grounding path between the grounding circuit of the fixture and the metal box.

3,663,920

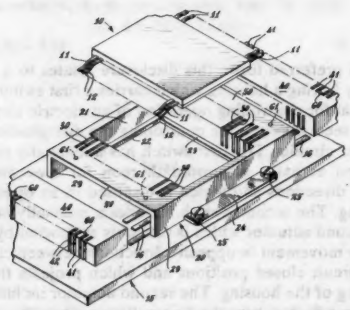
MOUNTING FOR INTEGRATED CIRCUITS

Thomas B. Lapham, Milford, Conn., and Leonard H. Feldberg, Spring Valley, N.Y., assignors to Burndy Corporation, Norwalk, Conn.

Filed July 27, 1970, Ser. No. 58,522

Int. Cl. H01r *13/54;* H05k *1/02*

U.S. Cl. 339—17 CF **8 Claims**



A large integrated circuit package is dropped into a housing that is attached to a printed circuit board in particular alignment with lead terminals on said board. Leads from the package are applied to the lead terminals when the package is properly positioned in the housing. A securing device having individual cams is moved into a position where it is assembled to the board and receiving means for applying camming pressure against said leads and lead terminals. The leads so engage the lead terminals that they are held against lateral movement during the camming action.

3,663,921

RECEPTACLE FOR CONNECTING SEMICONDUCTORS TO A CIRCUIT BOARD

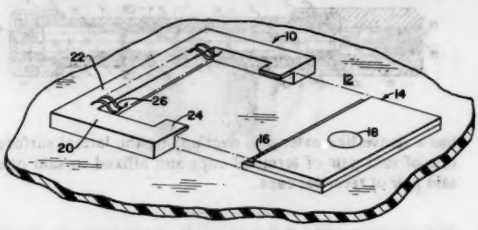
Donald F. Richard, Saratoga, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Filed July 7, 1970, Ser. No. 52,803

Int. Cl. H05k *1/02*

U.S. Cl. 339—17 CF **2 Claims**

A receptacle for installation on one surface of a circuit board for supporting a semiconductor package of the type having bonding pads along one side and providing an interconnection being the package and the circuit board. The receptacle has a generally channel-shaped planform with a series of contact members spaced apart along a central body



section. The contact members extend upwardly and outwardly from one side and register with bonding pads of the package. The lower ends of the contact members extend through the circuit board for connection with lead terminals on its other surface.

3,663,922

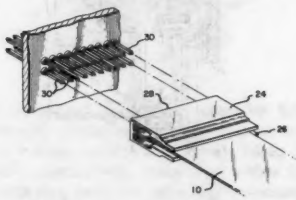
FLAT CABLE CONNECTORS HAVING TWO ROWS OF CONTACTS

Tilman Harrison Foust, Jr., Bryn Mawr, and Dale Richard Zell, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 18, 1971, Ser. No. 107,299

Int. Cl. H05k *1/04*

U.S. Cl. 339—17 F **9 Claims**



A connector for a flat cable has two opposed rows of contacts. The flat cable has signal conductors and a flat shield member which is terminated further from the end of the cable than the signal conductors. A row of signal contacts are crimped onto the signal conductors. The shield contacts extend beyond the signal contacts. The signal contacts can be crimped onto the signal conductors without making contact with the shield member. The shield contacts carry a shield connection through the connector for each signal conductor. In this way the impedance mismatch at the termination of the cable is reduced and impedance continuity through the conductor is improved.

3,663,923

ELECTRIC CIRCUIT BOARD AND CONNECTORS THEREFOR

Eugene H. Primoff, 15 Whitfield Terrace, New Rochelle, N.Y., and Alfred Eichner, 21 Warwick Avenue, Scarsdale, N.Y.

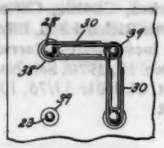
Filed Apr. 7, 1971, Ser. No. 128,610

Int. Cl. H01r *25/00;* H05k *1/02*

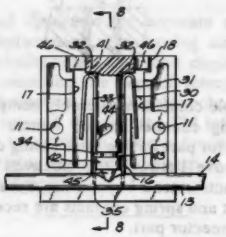
U.S. Cl. 339—18 C **4 Claims**

An electric circuit board for toy, kit or general use characterized in the provision of a plurality of contact terminals arranged in one or more parallel rows such that each terminal is spaced from an adjoining terminal a fixed predetermined distance, a first plurality of terminals having a first given

diameter, corresponding to the loop formed at one end of a conventional paper clip, and a second plurality of terminals alternately spaced with respect to said first plurality of terminals being of a second effective diameter corresponding to the inner diameter of a second end loop of the same paper clip, so that any pair of juxtaposed terminals may be interconnected for the conducting of a current therethrough by slipping the ends of the paper clips over said terminals to be resiliently retained thereby. In one embodiment of the invention, the terminals are provided with one or more parallel grooves extending into the cylindrical surface of the terminals to utilize the axial component of resiliency present in the paper clip.

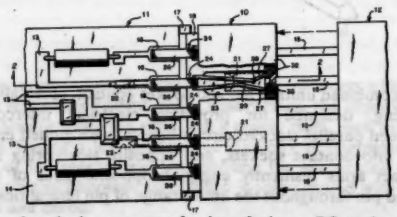


3,663,924
SAFETY OUTLET
Matthew E. Gerlat, 1334 North 123 St., Wauwatosa, Wis.
Filed Jan. 29, 1971, Ser. No. 111,043
Int. Cl. H01r *11/20*
U.S. Cl. 339—28 **12 Claims**



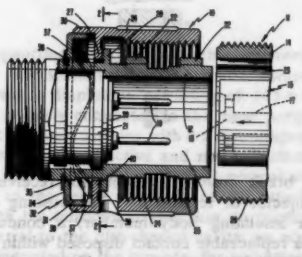
The device disclosed is an outlet which may be connected to a standard rubber insulated lamp cord without stripping the insulation and may be positioned at any point along the length of the cord. The cord piercing contacts are arranged to move with a clamp member which provides strain relief and which is so formed as to block the use of the outlet before the strain relief and the contacts are engaged and is further shaped to prevent the strain relief and the cord piercing contacts from being disengaged while a plug occupies the outlet.

3,663,925
ELECTRICAL CONNECTOR
Richard D. J. Proctor, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy
Filed May 20, 1970, Ser. No. 39,693
Int. Cl. H01r *13/62*
U.S. Cl. 339—65 **9 Claims**



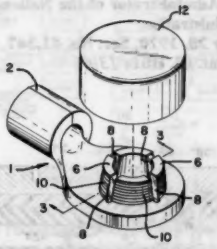
An electrical connector for interfacing a PC (printed circuit) board with external circuits. A nonconductive core, formed to engage the edge of the PC board adjacent to the printed circuit terminals, receives two rows of opposed contact springs, each spring having a bifurcated portion in the core for receiving a contact pin of an external circuit and a base portion extending outwardly for engaging either side of the circuit board at selected terminals. The bifurcated portions of each spring are inwardly inclined from their respective ends to form pin contact points developed from each other along their length. A nonconductive cover removably fitted over the core and springs provides accessibility for spring replacement and protection against contact pin damage.

3,663,926
SEPARABLE ELECTRICAL CONNECTOR
David S. Brandt, Oneonta, N.Y., assignor to The Bendix Corporation
Filed Jan. 5, 1970, Ser. No. 633
Int. Cl. H01r *13/54*
U.S. Cl. 339—89 R **10 Claims**



A separable electrical connector having two units held together in mated relationship by a nut. Means is provided for securely but releasably retaining the nut from rotation with respect to the mated units, thereby preventing the nut from being accidentally loosened from its fully tightened position.

3,663,927
BATTERY TERMINAL
Peter Martin Bruner, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 19, 1970, Ser. No. 12,792
Int. Cl. H01r *11/26*
U.S. Cl. 339—95 B **1 Claim**



The disclosure relates to a battery terminal which can quickly and easily be secured to a battery post without the aid of tooling and which is resistant to battery acids relative to prior art battery terminals. This is provided by the use of a threaded connector element which is inwardly compressable by a threaded cap, resistant to battery acids and the like, which is threaded on to the connector and compresses the portions thereof inwardly to make a frictionally locking contact with the battery post.

3,663,928

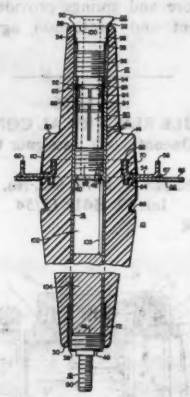
ELECTRICAL BUSHING ASSEMBLY

August I. Keto, Sharpsville, Pa., and Kenneth R. Klein, Niles, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 771,707, Oct. 30, 1968, now abandoned. This application Jan. 9, 1970, Ser. No. 1,828

Int. Cl. H01r *13/52*

U.S. Cl. 339—111 9 Claims



A load break bushing assembly for receiving a plug-in cable connector or termination. The bushing assembly includes an insulating body member, a conductive sleeve member, a replaceable contact disposed within the conductive sleeve member, and an arc confining and extinguishing member. In one embodiment of the invention a protective tube is disposed to span the contact and arc confining and extinguishing member, to protect the conductive sleeve member from arcing by-products and maintain the replaceable characteristic of the contact. The conductive sleeve member has a chamber sealed at one end with a terminal stud, with this chamber functioning as a gas surge expansion chamber when the plug-in cable connector is operated to make or break load current, making it unnecessary to vent the load break bushing into the enclosure of its associated apparatus.

3,663,929

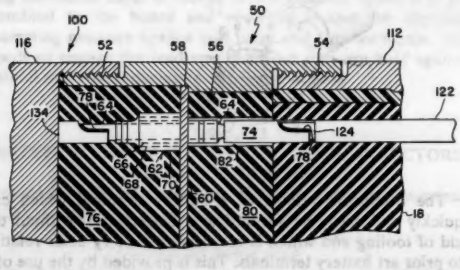
RADIO FREQUENCY FILTER DEVICE

Jerrold L. Miertschin, Arlington, Tex., and David H. Butler, Grafton, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed May 28, 1970, Ser. No. 41,347

Int. Cl. H01r *13/66*

U.S. Cl. 339—143 R 1 Claim



An electrical connector utilizing a pin assembly wherein the pin is coated with a dielectric and has a radio frequency energy absorbing sleeve around the dielectric and which is held in place by a solder coating. At the outer end of the radio frequency energy absorbing sleeve the pin grouping is adapted to receive an RF shield.

3,663,930

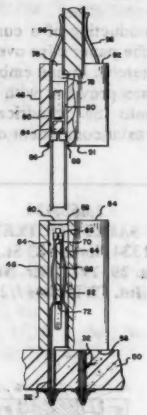
DISENGAGEABLE ELECTRICAL CONNECTOR

Homer Ernst Henschen, Carlisle; Clifton Wesley Huffnagle, Camp Hill, and Dale Richard Zell, Elizabethtown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 17, 1970, Ser. No. 99,188

Int. Cl. H01r *33/76, 13/06*

U.S. Cl. 339—192 R 4 Claims



Disengageable connector assembly comprises one connector part having channel shaped female pins therein and second connector part having male spring contacts which are adapted to move between the sidewalls of the channels. Channel contacts extend beyond the mating face of the one connector part and spring contacts are recessed in cavities in the second connector part.

3,663,931

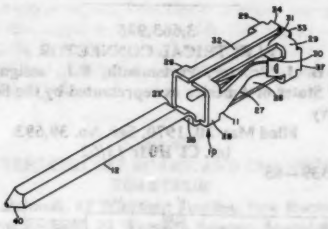
PIN AND SOCKET CONTACT ELECTRICAL INTERCONNECT SYSTEM

Elvin E. Brown, Cedar Rapids, Iowa, assignor to Collins Radio Company, Dallas, Tex.

Filed Nov. 25, 1970, Ser. No. 92,772

Int. Cl. H01r *9/08*

U.S. Cl. 339—218 R 19 Claims



A combined unitary pin and socket contact, receivable in a housing, designed for providing electrical interconnect between parallel stacked circuit boards, with guided entry of pins into contact sockets, and opposite side spring socket contact arms resiliently engaging opposite sides of an inserted pin throughout the entire range of pin lateral float.

3,663,932

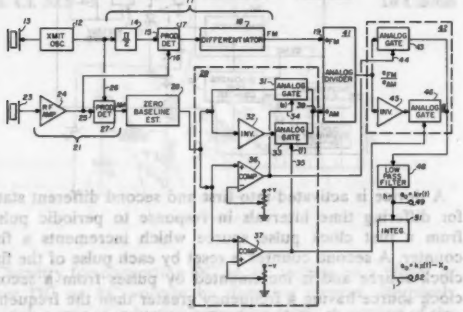
RECONSTRUCTION OF REFLECTING SURFACE VELOCITY AND DISPLACEMENT FROM DOPPLER SIGNALS

Bruce Elson Mount, Diamond Bar, Calif., and Harold Lee Massie, Hightstown, N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation-in-part of application Ser. No. 830,681, June 5, 1969, now abandoned. This application July 15, 1970, Ser. No. 54,983

Int. Cl. G01s 9/66

U.S. Cl. 340—1 R 16 Claims



A method and apparatus for accurate measurement of velocity and displacement of a moving surface by reconstructing the velocity-versus-time and displacement-versus-time functions comprising the steps of detecting the AM and FM or phase information of a Doppler echo signal from the surface to be measured, dividing the FM information by the AM information to obtain the velocity function, and, then, if desirable, performing an integrating step to obtain the relative displacement function.

3,663,933

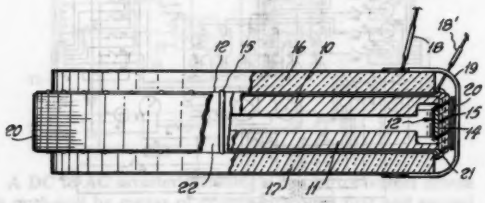
PROTECTIVE BAND FOR BILAMINAR TRANSDUCER WITH SLOTTED SPACER RING

Theodore C. Madison, Santa Barbara, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 2, 1970, Ser. No. 52,038

Int. Cl. G01v 1/16

U.S. Cl. 340—8 5 Claims



An improvement in bilaminar sonar transducers which employ slotted, compliant, outer spacer rings, the improvement comprising filling the slots with a plastic resin, such as epoxy resin, having a low modulus of elasticity as compared with that of the spacer ring, and banding the spacer ring with a wrapping of fiberglass tape which is impregnated with epoxy resin and cured.

3,663,934

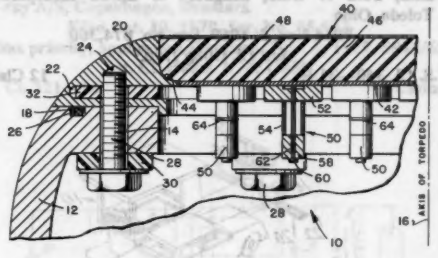
SELF-SUPPORTING TRANSDUCER ASSEMBLY

Harper John Whitehouse, Hacienda Heights, and Shelby F. Sullivan, Arcadia, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 8, 1969, Ser. No. 864,814

Int. Cl. H04b 11/00

U.S. Cl. 340—9 7 Claims



A self-supporting transducer assembly, mounted, for example, on the nose section shell of a torpedo, comprising an attachment ring; a diaphragm consisting of: (1) a tension-carrying skin, sealably connected to the inner periphery of the attachment ring, and forming with it a dish-shaped cavity; (2) an acoustically non-refractive and non-reflective composite material in the dish-shaped cavity; (3) a vapor seal, sealably connected to the inner periphery of the attachment ring, serving, with the tension-carrying skin, to confine the composite material to the dish-shaped cavity; an acoustic isolation joint, mounted on the torpedo, for acoustically isolating the transducer assembly from the torpedo; and at least one transducer element bonded directly to the tension-carrying skin.

3,663,935

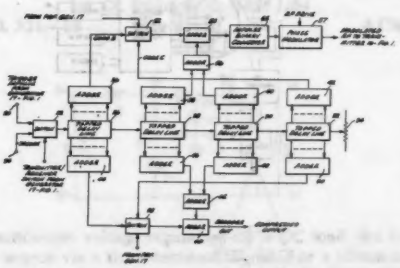
PULSE COMPRESSION CODE SEQUENCING SYSTEM

Alexander MacMullen, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 5, 1967, Ser. No. 643,514

Int. Cl. G01s g/233

U.S. Cl. 343—17.2 R 13 Claims



A pulse recognition coding and decoding system for use in a binary phase coded high resolution radar, wherein a transmitter of a high resolution radar is modulated with different codes at successive pulse repetition periods. By selection of predetermined codes which are alternately coded, transmitted, received and decoded, a wide pulse is transmitted and then compressed. The codes are provided by alternate selection of portions of a tapped delay line wherein the selected coded pulses are presented to the transmitter. On receive, the same delay lines are used to present the alternate codes t o a memory device. The selected codes are alternate-

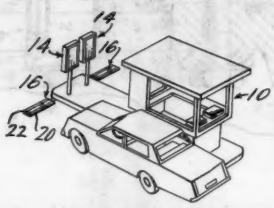
ly applied to a memory device where they are combined. The memory device performs the averaging process, suppressing the sidelobes and adding at the main lobes in the well known manner.

3,663,936

ADMISSION SYSTEM FOR DRIVE-IN ENTERPRISES

Angelo Boudouris, Sylvania, and Stanley J. Kulish, Jr., Holland, both of Ohio, assignors to Eprad Incorporated, Toledo, Ohio

Filed Nov. 5, 1969, Ser. No. 874,360
Int. Cl. G08g 1/065
U.S. Cl. 340—31 R 12 Claims



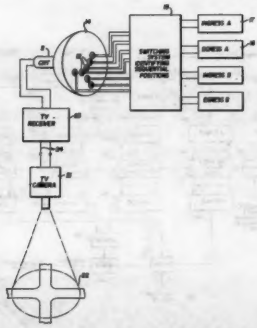
An admission system is designed for use with drive-in enterprises wherein patrons enter the premises in automobiles. The admission system has a number of unique features including a cumulative counter for automatically totalling the number of patrons entering the premises at each predetermined admission rate. The system also includes a lock-out feature for preventing premature operation of the system as an automobile approaches the entrance. Further, the system has additional counters for totalling all automobiles entering the premises and all transactions completed.

3,663,937

INTERSECTION INGRESS-EGRESS AUTOMATIC ELECTRONIC TRAFFIC MONITORING EQUIPMENT

Thomas E. Bolner, Fayetteville, Tenn., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Filed June 8, 1970, Ser. No. 44,491
Int. Cl. G08g 1/04
U.S. Cl. 340—38 P 8 Claims



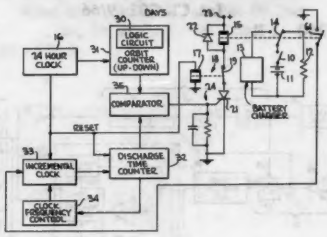
An electronic detection circuit identifies several traffic paths through an intersection as a vehicle passes over a predetermined sequence of discrete separated positions identifying a path. A television camera can view the intersection and the paths be identified on a receiving cathode ray tube screen by placing a series of light detectors over desired patterns. A switching circuit responsive to the detectors then identifies and counts only those vehicles passing one complete sequence of the positions identifying a particular path.

3,663,938

SYNCHRONOUS ORBIT BATTERY CYCLER

David A. Baer, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed May 3, 1971, Ser. No. 139,528
Int. Cl. H02j 7/00; G06f 7/38; G01n 27/42
U.S. Cl. 320—48 7 Claims



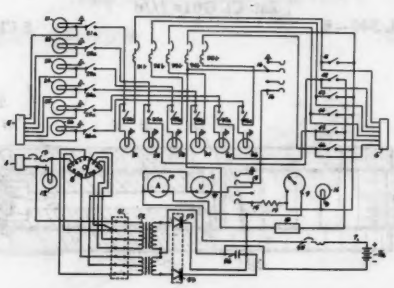
A device is activated into first and second different states for differing time intervals in response to periodic pulses from a first clock pulse source which increments a first counter. A second counter is reset by each pulse of the first clock source and is incremented by pulses from a second clock source having a frequency greater than the frequency of the pulses derived from the first clock source. In response to the counts of the two counters being the same, a comparator derives an output response. The device is activated to the first state during the time interval between pulses from the first clock source and the output response and is activated into the second state for a time interval between the derivation of the output response and the next succeeding pulse from the first clock source. In one particular use, the system is employed for alternately connecting a battery to a battery charger and load for simulating the charging and discharging characteristics, respectively, of the battery as if it were located on a synchronous artificial earth satellite.

3,663,939

COMBINATION TEST BOX AND BATTERY CHARGER

Hans Olsson, 40 Merril Street, San Francisco, Calif.

Filed Dec. 21, 1970, Ser. No. 99,894
Int. Cl. G01r 31/02
U.S. Cl. 320—48 2 Claims



This invention comprises a portable test box for checking the electrical circuits between a tractor and a trailer, as employed in typical diesel or other tractor-trailer arrangements. Essentially a maintenance device, it is constructed so as to be connectible between the wires coming from the tractor and those leading to the trailer so that by proper manipulation of switches rapid indication of open, grounded, or short circuits in the lighting and other wiring is readily indicated. The novel construction permits use of either the vehicle's battery

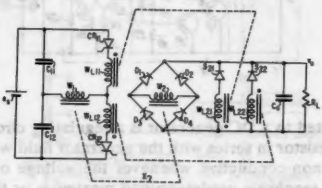
as a source of power for testing or an outside source of power. The novel construction and circuitry permits also the use of the device for charging of the vehicle battery from an outside source.

3,663,940

CONTROLLABLE, LOAD INSENSITIVE POWER CONVERTERS

Francis Schwarz, Weston, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed May 21, 1970, Ser. No. 39,342
Int. Cl. H02m *3/32*
U.S. Cl. 321—2 **18 Claims**



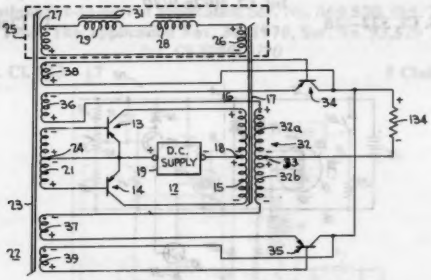
Circuitry for converting DC or AC voltage to a higher or lower DC or AC voltage by directing current alternately through a pair of inductive-capacitive loops. A portion of the inductance of each loop is magnetically coupled to another inductance whose current is rectified and supplied to a load. Voltage sensing circuits are utilized to time the flow of current through the pair of loops. Energy is magnetically coupled from the load circuit to the inductance of the pair of loops to improve starting and overload operating conditions.

3,663,941

DC TO AC TO DC CONVERTER HAVING TRANSISTOR SYNCHRONOUS RECTIFIERS

Edward R. Pasciutti, Beltsville, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 16, 1970, Ser. No. 98,640
Int. Cl. H02m *3/14*; H03k
U.S. Cl. 321—2 **11 Claims**



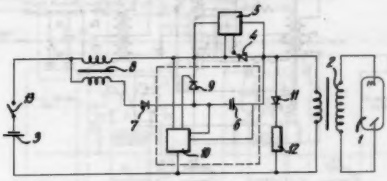
A DC to AC inverter including a pair of transistors driven in push-pull by means of coupling through first and second transformers, each having a saturable core, drives a DC load through a synchronous rectifier. The synchronous rectifier includes a pair of transistors, the emitter collector junctions of which are driven with the same waveshape as the emitter base junctions of the inverter. A circuit connecting the two transformers together includes a saturable reactor, whereby the base drive for the transistors of the inverter and the synchronous rectifier is a waveform having two relatively steep transitions in opposite directions at the moment of switch on to remove charge stored on the bases and a further relatively steep transition prior to cut off to minimize charge stored on the bases during conducting intervals of the transistors.

3,663,942

CIRCUIT ARRANGEMENT FOR TRANSFORMING THE VOLTAGE OF A DC VOLTAGE SOURCE INTO A PULSATING VOLTAGE

Niels Jakobsen, Kastrup, Denmark, assignor to Picker-Andrex X-ray A/S, Copenhagen, Denmark

Filed Oct. 30, 1970, Ser. No. 85,632
Claims priority, application Denmark, Nov. 7, 1969, 5914/69
Int. Cl. H02m *1/18*; G05f
U.S. Cl. 321—14 **5 Claims**



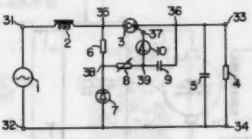
A circuit arrangement for supplying a load, e.g. an X-ray tube, with a pulsating voltage by means of a DC voltage source connected in series with the load and a controllable rectifier, which is extinguished by means of the charge on a commutating capacitor, which, via a current transformer, is charged by the leading edges of the load current, and the discharge of which is controlled, via a timing device, by the voltage across the commutating capacitor. Means may be provided for reducing the time constant of the timing device when the load current exceeds a given value.

3,663,943

AUTOMATIC VOLTAGE REGULATING SYSTEM FOR A DC LOAD

Tositaka Nakajima; Tomoyuki Okubo; Manabu Kobayashi, and Kimio Yoshioka, all of Kawasaki-shi, Japan, assignors to Fuji Denki Seizo Kabushiki Kaisha, Kawasaki-shi, Japan

Filed Sept. 15, 1970, Ser. No. 72,729
Claims priority, application Japan, Aug. 5, 1969, 44/61925; 44/61926; 44/61927; Mar. 20, 1970, 45/23800; Apr. 8, 1970, 45/29886; Apr. 20, 1970, 45/33654; May 25, 1970, 45/44682
Int. Cl. H02m *7/20*; G05f *1/64*
U.S. Cl. 321—18 **4 Claims**



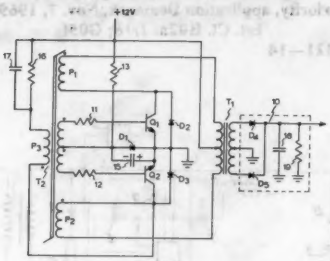
For automatic voltage regulation for a DC load, fed from an AC source via a three-terminal thyristor or a silicon-controlled rectifier, a constant-voltage element is connected in parallel to the AC source via a nonvariable resistance, and a capacitor is provided which is charged, via a variable resistance, with a voltage corresponding to a difference between the constant voltage of the aforesaid constant-voltage element and the voltage of the DC load, the voltage of said capacitor being impressed to the control terminals of the three-terminal thyristor, i.e., the gate and cathode terminals of the silicon-controlled rectifier, via a threshold-value element (e.g., a Shockley diode) that becomes conductive when the voltage of the capacitor reaches a predetermined threshold value.

3,663,944

INVERTER OSCILLATOR WITH VOLTAGE FEEDBACK

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of; Kurt Willner, 6317 Maryland Drive, Los Angeles, Calif., and William T. McLyman, 2129 Lark Bay Lane, Lakewood, Calif.

Filed Mar. 29, 1971, Ser. No. 129,071
Int. Cl. H02m 3/28
U.S. Cl. 321—45 R 8 Claims



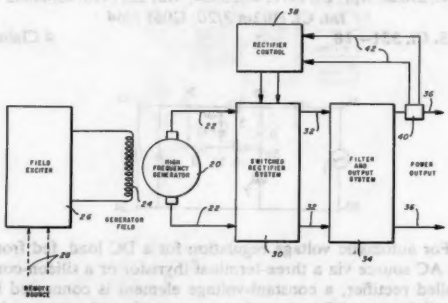
An oscillator is disclosed for use in an inverter for a wide range of load using two transistors connected in a push-pull amplifier configuration having current feedback through primary windings of a saturable transformer connected in series with an output transformer between collectors of the transistors. Voltage feedback is provided through a third primary winding of the saturable transformer connected in series with a resistor between the collector of one transistor and a center tap in the primary winding of the output transformer.

3,663,945

APPARATUS FOR PROVIDING AC ELECTRICAL ENERGY AT A PRESELECTED FREQUENCY

William L. Hughes; Hansel J. Allison, and Ramachandra G. Ramakumar, all of Stillwater, Okla., assignors to Oklahoma State University, Stillwater, Okla.

Filed Sept. 4, 1970, Ser. No. 69,675
Int. Cl. H02m 5/00
U.S. Cl. 321—61 13 Claims



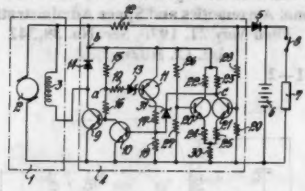
A method and apparatus for providing AC electrical energy at a preselected frequency including a driven AC generator having an externally excitable field, means connected to the generator field for exciting the field at the preselected frequency whereby the generated AC output is modulated at the preselected frequency, and rectifier means connected to the generator output by which the modulated generator output is rectified to obtain AC output at the preselected frequency, the frequency of the AC output being independent of the speed of rotation of the AC generator.

3,663,946

GENERATOR ARRANGEMENT WITH REGULATED OUTPUT

Katsutaro Iwaki, Aichi Ken, Japan, assignor to Nippon Denso Kabushiki Kaisha, Aichi Ken, Japan

Filed Nov. 13, 1970, Ser. No. 89,353
Claims priority, application Japan, Nov. 14, 1969, 44/108800
Int. Cl. H02p 9/30
U.S. Cl. 322—23 15 Claims



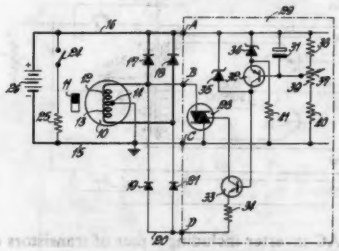
Connected to a DC generator is a regulating circuit having a first transistor in series with the generator field winding and rendered non-conductive whenever the voltage output of a generator reaches a predetermined maximum or the generator output current reaches a maximum that increases in value as the ambient temperature falls. A differential amplifier is connected to a positive temperature coefficient resistor, carrying at least part of a load current, to furnish differential voltage of increasing value as the voltage drop across the positive temperature coefficient resistor increases, for rendering the first transistor non-conductive when this difference voltage reaches a sufficient value. A second transistor is turned on when the generator output voltage reaches a predetermined value, thereby turning off the first transistor.

3,663,947

VOLTAGE REGULATOR ARRANGEMENT FOR GENERATORS WITH PERMANENT MAGNETIC EXCITATION

Peter Pfefeer, Lauffen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed June 25, 1970, Ser. No. 49,761
Claims priority, application Germany, July 4, 1969, P 19 33 948.1
Int. Cl. H02p 9/30
U.S. Cl. 322—26 13 Claims



A voltage regulating arrangement in which an alternating current generator with means for permanent magnetic excitation, has two output windings magnetically intercoupled. The junction between the two windings is connected to ground potential, whereas the remaining terminals of the output winding are connected to two rectifying circuits. A triac is connected in parallel with one of the windings, and one of the rectifying circuits provides a negative control voltage which is applied to the triac through a control circuit con-

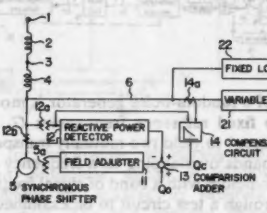
taining complementary transistors. The rectifying circuits provide a DC output voltage, and the triac is switched to the conducting state through the negative control voltage, whenever the rectified DC output voltage exceeds a predetermined level.

3,663,948

APPARATUS FOR CONTROLLING POWER DISTRIBUTION IN SUBSTATION

Masaomi Nagae, and Sumio Yokowa, both of Kawasaki, Japan, assignors to Fuji Denki Seizo Kabushiki Kaisha, Kawasaki-shi, Japan

Filed Oct. 7, 1970, Ser. No. 78,861
Claims priority, application Japan, Oct. 11, 1969, 44/81339
Int. Cl. G05f *1/12*
U.S. Cl. 323—8 **3 Claims**



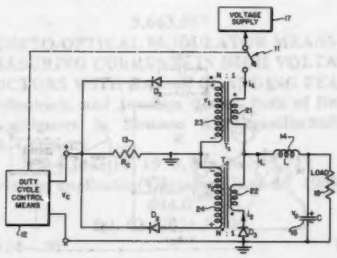
An apparatus for controlling voltage flicker in power distribution in a substation, comprising a synchronous condenser, a field adjuster for the synchronous condenser and a compensation circuit, said apparatus being adapted to compensate the distribution voltage flicker due to a large load variation in said substation and being able to adjust a predetermined distribution voltage within an allowable range. The compensation circuit may include an incomplete differential circuit and means for feeding the sum of the products respectively obtained by multiplying the variable part of the respective power of each load and its respective weight coefficient.

3,663,949

CURRENT SENSING OF INDICATOR CURRENT IN SERIES WITH TRANSFORMER WINDING

Thomas A. Froeschle, Framingham, Mass., assignor to Bose Corporation, Natick, Mass.

Continuation-in-part of application Ser. No. 869,520, Oct. 27, 1969. This application Nov. 30, 1970, Ser. No. 93,529
Int. Cl. G05f *1/20*
U.S. Cl. 323—17 **5 Claims**



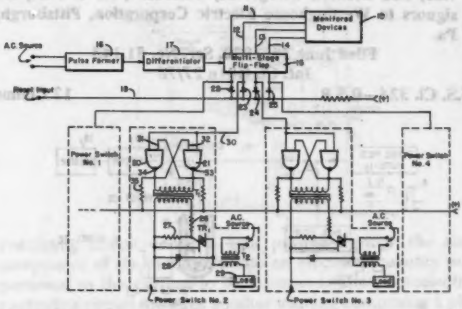
In a two-state current-controlled system, a power switch is connected in series with the primary of a first transformer in series with an output inductor connected to the output terminal. The primary of a second transformer is connected in series with a diode connected to ground and the inductor. The secondaries of the first and second transformers are connected in series with respective controlled avalanche reset diodes that are connected to a current sensing resistance having its other end connected to ground so that the voltage across the current sensing resistance is representative of the current through the inductor.

3,663,950

QUAD AC POWER SWITCH WITH SYNCH

Peter G. Bartlett, Davenport, Iowa, assignor to Struthers-Dunn, Inc., Pitman, N.J.

Filed Jan. 19, 1970, Ser. No. 3,801
Int. Cl. G05f *5/00*
U.S. Cl. 323—24 **2 Claims**



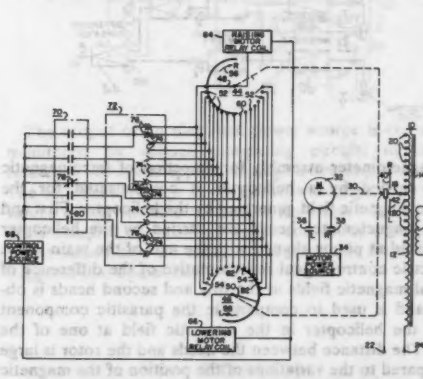
Circuit for controlling the energization of an alternating-current load in which the load is electrically isolated from the controlling input. Energization of the load is controlled by a bi-directional thyristor whose gate electrode is energized with a high frequency, square-wave voltage provided by a pair of interconnected NAND gates. A synchronizing signal obtained from the alternating-current power source controls the NAND gates so that they become effective to produce a square-wave signal for the gate electrode of the thyristor as the alternating-current source goes through zero amplitude, and the thyristor again becomes cut off when the current through the load approaches zero, with the result that switching of the load is timed to occur when it will produce the fewest transients and noise throughout the system.

3,663,951

MOTOR OPERATED TAP CHANGER EMPLOYING CONTACT DRUM SWITCHES

Herbert L. Prescott, Brookfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1971, Ser. No. 141,147
Int. Cl. H02p *13/06*; G05f *1/14*
U.S. Cl. 323—43.5 R **4 Claims**



Tap position selector device for controlling a motor operated tap changing mechanism. A selector switch is con-

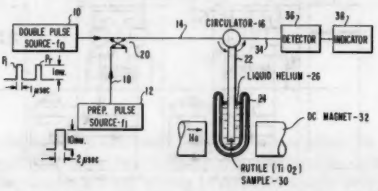
nected to two multiple contact drum switches. The drum switches are interconnected so that one drum switch conducts only when the selector switch requires that the tap position be raised and the other drum switch conducts only when the selector switch requires that the tap position be lowered. The movable contacts of both drum switches move with the tap changing mechanism.

3,663,952

ELECTRON SPIN ECHO SYSTEM HAVING RF PULSE INVERSION PREPARATION OF THE SPIN ECHO SAMPLE

Donald A. Bozanic, Baltimore; Ronald W. Minarik, Lutherville, and Dickron Mergerian, Baltimore, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 30, 1970, Ser. No. 51,143
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 R 12 Claims



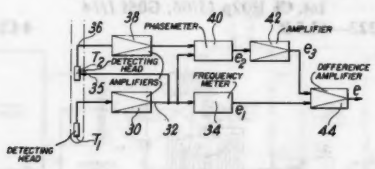
Method and apparatus for inverting the population of a pair of adjacent spin levels associated with a spin-echo sample when situated in a unidirectional magnetic field by means of a preparatory inversion RF pulse of a different RF frequency from the RF frequency of the input and recall RF pulses necessary for the generation of a spin-echo signal.

3,663,953

HELICOPTER CARRIED MAGNETOMETER ASSEMBLY COMPENSATED FOR THE PARASITIC FIELD OF THE HELICOPTER

Antoine Salvi, Fontaine, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Sept. 17, 1970, Ser. No. 73,106
Int. Cl. G01r 33/02
U.S. Cl. 324—43 R 9 Claims



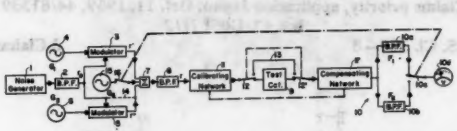
A magnetometer assembly for detection of ferromagnetic targets carried by a helicopter is compensated for the parasitic magnetic field generated by the helicopter. First and second magnetometer heads are carried by the helicopter and located at points aligned with the axis of the main rotor. An electric control signal representative of the difference of the total magnetic fields at the first and second heads is obtained and is used to compensate the parasitic component due to the helicopter in the magnetic field at one of the points. The distance between the heads and the rotor is large as compared to the variations of the position of the magnetic center of gravity of the helicopter and as compared to the distance between the heads.

3,663,954

SYSTEM FOR MEASURING HIGHER ORDER NONLINEARITIES OF A SIGNAL/TRANSMITTING NETWORK

Dietrich-Ekkehard Alker, Eningen, Germany, assignor to Wandel & Goltermann, Reutlingen and Franz-Josef Landwehr, Munster, Germany, part interst to each

Filed July 10, 1970, Ser. No. 53,948
Claims priority, application Germany, July 11, 1969, P 10 35 205.7
Int. Cl. G01n 27/00
U.S. Cl. 324—57 R 4 Claims



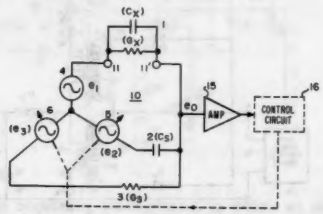
The output of a random-noise generator is modulated with the aid of two fixed reference frequencies G_1, G_2 (one of which may be zero) to yield two mutually transposed but correlated noise bands overlapping in a frequency range which substantially coincides with a band of signal frequencies to be transmitted through a test circuit to be examined for second-order and third-order nonlinearities. With the sum or difference of any two correlated signal frequencies f_i', f_i'' in the two noise bands equal to a primary beat frequency $F_1 = G_2 \pm G_1$, the amplitude of a signal of this beat frequency in the output of the test circuit receiving the two wholly or partly coincident noise bands is a measure of second-order nonlinearity of that test circuit throughout the signal band. The superposition of a pilot oscillation of frequency G_3 (lying within the pass band of the test circuit) upon the primary beat frequency F_1 gives rise to a secondary beat frequency $F_2 = F_1 \pm G_3$ whereby the amplitude of another output signal, having this frequency F_2, is a measure of third-order nonlinearity of the test circuit.

3,663,955

APPARATUS FOR DETECTING ERROR DIRECTION TO ESTABLISH THE BALANCED STATE OF A BRIDGE CIRCUIT

Takeo Shimizu, Tokyo, Japan, assignor to Yokogawa-Hewlett-Packard, Ltd., Tokyo, Japan

Filed Oct. 23, 1970, Ser. No. 83,313
Claims priority, application Japan, Oct. 24, 1969, 44/85558
Int. Cl. G01r 27/00
U.S. Cl. 324—57 R 3 Claims

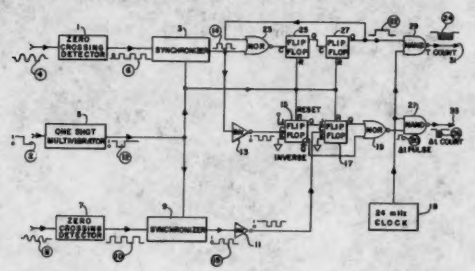


The balanced state of a bridge circuit, for example, which measures the capacitance of an unknown capacitor by means of a self-balancing type transformer bridge, or the like, is determined from comparison of two split phase components with suitable reference levels as the bridge is automatically adjusted to a balanced condition.

3,663,956
DIGITAL PHASE MEASUREMENT COMPUTATION CIRCUIT

Bruce W. Purdy, Bristol, and Donato Perti, Portsmouth, both of R.I., assignors to Ocean Data Equipment Corp., East Providence, R.I.

Filed July 1, 1970, Ser. No. 51,588
Int. Cl. G01r *25/00*; H03d *13/00*
U.S. Cl. 324—83 D **14 Claims**



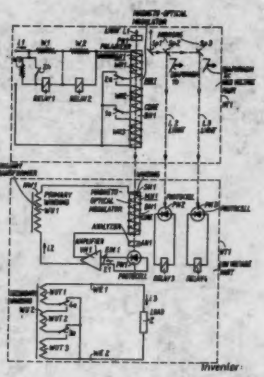
Circuitry for accurately measuring the phase angle between two sinusoidal signals is disclosed. The two sinusoidal signals are squared by separate axis or zero crossing detectors. The two squared signals are further processed to obtain a first pulse T, the duration of which is equal to the period of the signals under test and a second signal Δt, the duration of which is equal to the time difference between the two signals under test. The T and Δt pulses are used to gate a high frequency clock and the resulting clock pulses, or counts, are incremented into two binary counters (a T counter and a Δt counter). Thus, a number proportional to the period T of the signals under test (T count) is stored in the T counter and a number proportional to the time difference between the two signals under test (Δt count) is stored in the Δt counter. The T and Δt counts are preset into respective binary programmable dividers. The programmable dividers have the property of dividing the frequency of an input clock (fc) by the preset number. Thus, the output of one divider is fc/T and the output of the other counter is $fc/\Delta t$. The fc/T count is fed into a binary to decimal counter and the $fc/\Delta t$ count is fed into a binary counter. Both counters are disabled when 3,600 $fc/\Delta t$ clock pulses have been counted in the binary counter. The number stored in the binary to decimal counter is the phase angle in tenths of a degree since the following computation has been performed: $\theta = \Delta t/T \times 3{,}600$. A decimal display device is connected to the output of the binary coded decimal counter to provide a visual display of the phase angle reading.

3,663,957
MAGNETO-OPTICAL MODULATOR MEANS FOR MEASURING CURRENTS IN HIGH VOLTAGE CONDUCTORS WITH RANGE CHANGING FEATURES

Klaus Mollenbeck, and Joachim Bensel, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed June 19, 1970, Ser. No. 47,712
Claims priority, application Germany, June 24, 1969, P 19 33 044.0
Int. Cl. G01r *31/00*
U.S. Cl. 324—96 **13 Claims**

A magneto-optical modulator at high voltage potential rotates the plane of polarization of light supplied thereto in accordance with the magnitude of a current to be measured. The modulator comprises a core component and a field winding wound around a core component for rotating the plane of polarization of light supplied to the core component. The field winding comprises a plurality of component windings thereby providing a wide range of measurement. Switches interconnect the component windings of the field winding of the modulator for varying the number of component windings connected in circuit thereby varying the magnetic field produced thereby in the manner of an independent measuring range switch in accordance with the magnitude of the current to be measured. A photoelectric

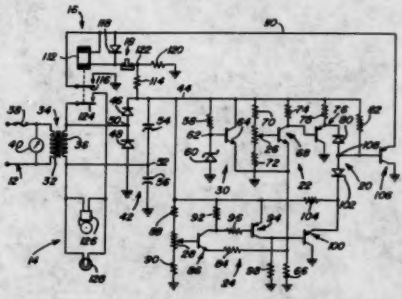


evaluating circuit converts light passing through the core component of the modulator into an electrical quantity proportional to the current to be measured. The photoelectric evaluating circuit includes another winding comprising a plurality of component windings for coupling the load to the measuring device thereby providing a range switch of low voltage potential corresponding to the measuring range switch at high voltage potential.

3,663,958
VOLTAGE MONITORING DEVICE HAVING A PAIR OF DIFFERENTIAL AMPLIFIERS

Harold E. Crane, Resco Inc., 805 Central Avenue, New Orleans, La.

Filed June 24, 1970, Ser. No. 49,491
Int. Cl. G01r *19/14*; G08b *21/00*
U.S. Cl. 324—133 **9 Claims**



The output of an electrical power source is continuously monitored by voltage comparing circuits to which a reference voltage is applied through a low impedance driver. The reference voltage is compared with adjustably reduced values of the variable voltage of the source being continuously sampled to establish upper and lower voltage limits. When these limits are exceeded, a resettable alarm circuit is triggered into operation.

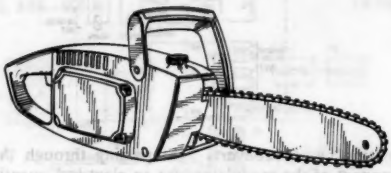
ERRATUM

For Class 343—17 R see:
Patent No. 3,663,935

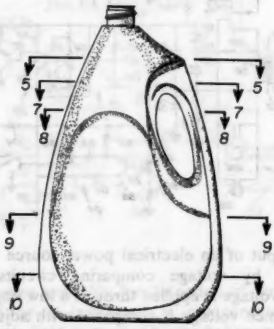
DESIGNS

MAY 16, 1972

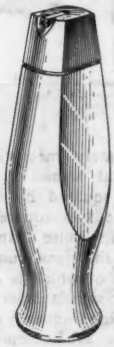
223,600
CHAIN SAW
Marnie C. Averitt, Timonium, Md., assignor to DESA Industries, Inc., Cockeysville, Md.
Filed Oct. 9, 1970, Ser. No. 25,420
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—65



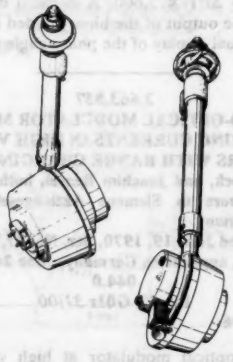
223,601
JUG
Roland E. Johnson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed July 23, 1970, Ser. No. 24,075
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—42



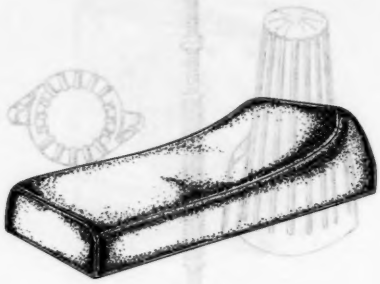
223,602
COMBINED BOTTLE AND DISPENSING CLOSURE
Harold Clarence Hoffman, Naperville, Ill., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 29, 1970, Ser. No. 26,697
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—2



223,603
POWER DRIVEN RADIO ANTENNA FOR AUTOMOBILE
Nobuyoshi Takagi, Aichi, and Tadashi Hattori, Kariya, Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Japan
Filed Dec. 22, 1970, Ser. No. 26,617
Term of patent 14 years
Int. Cl. D12—*14*; D14—*03*
U.S. Cl. D14—6

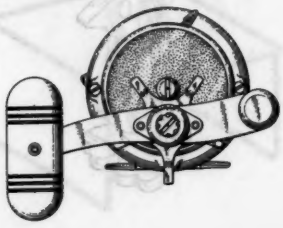


223,604
SNOWMOBILE SEAT
Anthony MacKeen and Yves Anselme Lapointe, Valcourt, Quebec, Canada, assignors to Bombardier Limited, Valcourt, Quebec, Canada
Filed Oct. 7, 1969, Ser. No. 19,452
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—24

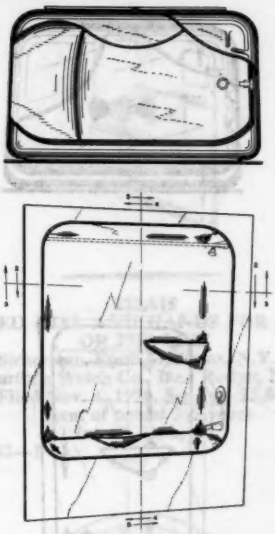


223,605
FISHING REEL
Koji Endo, Tokyo, and Tsuneharu Fukazawa, Saitama, Japan, assignors to True Temper Corporation, Cleveland, Ohio
Filed Nov. 2, 1970, Ser. No. 25,778
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

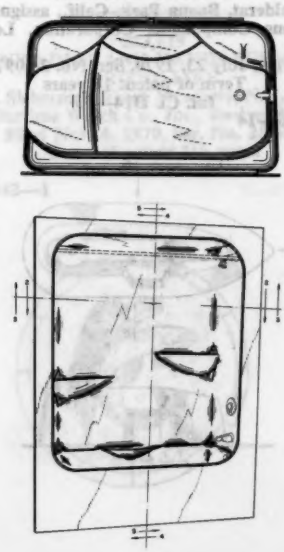
223,606
FISHING REEL
Roy P. Hess, Cleveland Heights, Ohio, assignor to True Temper Corporation, Cleveland, Ohio
Filed Jan. 4, 1971, Ser. No. 103,957
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



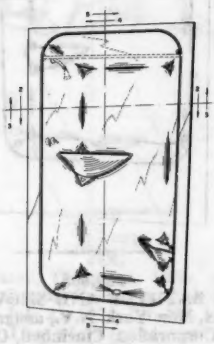
223,607
COMBINED BATHTUB AND SHOWER MODULE
Michael Lax, New York, N.Y., assignor to Formica Corporation, Cincinnati, Ohio
Continuation-in-part of design application Ser. No. 20,348, Dec. 3, 1969. This application July 1, 1970, Ser. No. 23,789
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



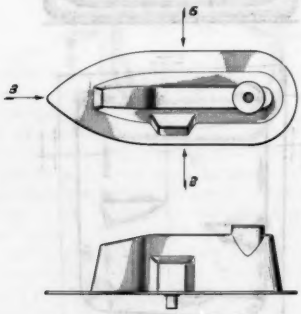
223,608
COMBINED BATHTUB AND SHOWER MODULE
Michael Lax, New York, N.Y., assignor to Formica Corporation, Cincinnati, Ohio
Continuation-in-part of design application Ser. No. 20,337, Dec. 3, 1969. This application July 1, 1970, Ser. No. 23,791
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



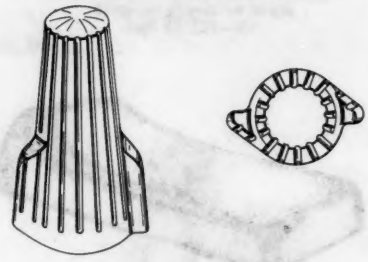
223,609
MODULAR SHOWER STALL
Michael Lax, New York, N.Y., assignor to Formica Corporation, Cincinnati, Ohio
Continuation-in-part of design application Ser. No. 20,336, Dec. 3, 1969. This application July 1, 1970, Ser. No. 23,790
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—57



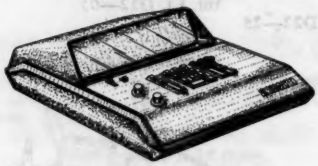
223,610
ANTENNA MATCHING MODULE OR SIMILAR ARTICLE
Jerry C. Walderat, Buena Park, Calif., assignor to Communications Components Corporation, Long Beach, Calif.
Filed July 23, 1970, Ser. No. 24,097
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



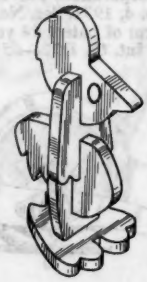
223,611
ELECTRICAL WIRE CONNECTOR
Gail A. Anderson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Dec. 21, 1970, Ser. No. 26,607
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1



223,612
DESK ELECTRONIC CALCULATOR
Tetsuo Kashiwagi, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 6, 1970, Ser. No. 25,852
Claims priority, application Japan May 16, 1970
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

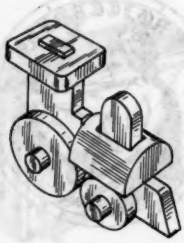


223,613
TOY CHICKEN FIGURE
Harry Meth, Cincinnati, Ohio, assignor to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Oct. 26, 1970, Ser. No. 25,666
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2

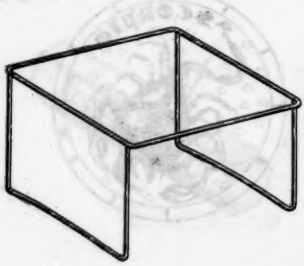


223,614
EXERCISE ROD OR SIMILAR ARTICLE
Jan Andre Koolbergen, Bentveld, Netherlands, assignor to Compret N.V., Amsterdam, Netherlands
Filed Jan. 11, 1971, Ser. No. 105,787
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

223,615
TOY TRAIN ENGINE
Harry Meth and Susan Lake, Cincinnati, Ohio, assignors to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Oct. 26, 1970, Ser. No. 25,667
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



223,616
FILE RACK
David Woods, Quakertown, Pa., assignor to J. G. Furniture Company, Inc., New York, N.Y.
Original design application Jan. 2, 1969, Ser. No. 15,184. Divided and this application May 19, 1969, Ser. No. 17,201
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—3



223,617
STORAGE RACK FOR ATTACHMENT TO WALL LOCKERS OR THE LIKE
Donald E. Smith, 1671 South 50 West, Bountiful, Utah 84010, and Amasa Merrill Linford, 1720 Michigan Ave., Salt Lake City, Utah 84108
Filed July 9, 1970, Ser. No. 23,872
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—3

223,618
COMBINED DIAL AND HANDS FOR A WATCH OR THE LIKE
Sondra J. Sicherman, Fresh Meadows, N.Y., assignor to Startime Watch Co., Inc., Roslyn, N.Y.
Filed Nov. 4, 1970, Ser. No. 25,805
Term of patent 3½ years
Int. Cl. D10—*07*
U.S. Cl. D42—1

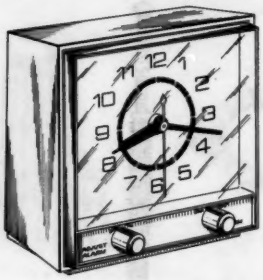
223,619
COMBINED DIAL AND HANDS FOR A WATCH OR THE LIKE
Sondra J. Sicherman, Fresh Meadows, N.Y., assignor to Startime Watch Co., Inc., Roslyn, N.Y.
Filed Nov. 4, 1970, Ser. No. 25,806
Term of patent 3½ years
Int. Cl. D10—*07*
U.S. Cl. D42—1

223,620
COMBINED DIAL AND HANDS FOR A WATCH OR THE LIKE
Sondra J. Sicherman, Fresh Meadows, N.Y., assignor to Startime Watch Co., Inc., Roslyn, N.Y.
Filed Nov. 4, 1970, Ser. No. 25,808
Term of patent 3½ years
Int. Cl. D10—*07*
U.S. Cl. D42—1

223,621
COMBINED DIAL AND HANDS FOR A WATCH OR THE LIKE
Sondra J. Sicherman, Fresh Meadows, N.Y., assignor to Startime Watch Co., Inc., Roslyn, N.Y.
Filed Nov. 4, 1970, Ser. No. 25,809
Term of patent 3½ years
Int. Cl. D10—*07*
U.S. Cl. D42—1

223,622
COMBINED DIAL AND HANDS FOR A WATCH OR THE LIKE
Sondra J. Sicherman, Fresh Meadows, N.Y., assignor to Startime Watch Co., Inc., Roslyn, N.Y.
Filed Nov. 4, 1970, Ser. No. 25,811
Term of patent 3½ years
Int. Cl. D10—*07*
U.S. Cl. D42—1

223,623
CLOCK OR SIMILAR ARTICLE
Walter C. Anderson, Redding, Conn., assignor to General Electric Company
Filed Sept. 2, 1970, Ser. No. 24,814
Term of patent 3½ years
Int. Cl. D10—*01*
U.S. Cl. D42—7

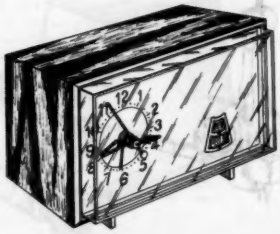


223,624
COMBINED DIAL AND HANDS FOR A WATCH OR THE LIKE
Sondra J. Sicherman, Fresh Meadows, N.Y., assignor to Startime Watch Co., Inc., Roslyn, N.Y.
Filed Nov. 4, 1970, Ser. No. 25,815
Term of patent 3½ years
Int. Cl. D10—*07*
U.S. Cl. D42—1

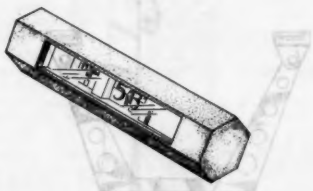
223,625
COMBINED DIAL AND HANDS FOR A WATCH OR THE LIKE
Sondra J. Sicherman, Fresh Meadows, N.Y., assignor to Startime Watch Co., Inc., Roslyn, N.Y.
Filed Nov. 4, 1970, Ser. No. 25,813
Term of patent 3½ years
Int. Cl. D10—*07*
U.S. Cl. D42—1

223,626
COMBINED DIAL AND HANDS FOR A WATCH OR THE LIKE
Sondra J. Sicherman, Fresh Meadows, N.Y., assignor to Startime Watch Co., Inc., Roslyn, N.Y.
Filed Nov. 4, 1970, Ser. No. 25,814
Term of patent 3½ years
Int. Cl. D10—*07*
U.S. Cl. D42—1

223,627
CLOCK OR SIMILAR ARTICLE
William V. Judson, Westport, Conn., assignor to General Electric Company
Filed Oct. 6, 1970, Ser. No. 25,357
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7

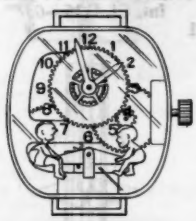


223,628
CALENDAR CLOCK OR SIMILAR ARTICLE
Riki Watanabe, Tokyo, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo, Japan
Filed Jan. 5, 1971, Ser. No. 104,189
Claims priority, application Japan July 8, 1970
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7

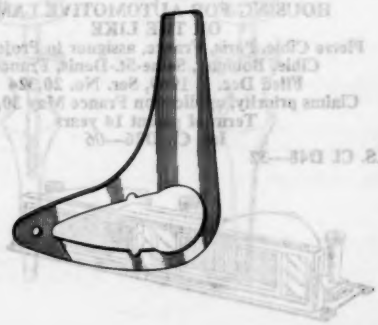


223,629
CLOCK OR SIMILAR ARTICLE
Franklin M. Wills, Chicago, Ill., assignor to Burwood Products Company, Chicago, Ill.
Filed Feb. 16, 1971, Ser. No. 115,903
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7

223,630
WATCH
Bruce A. Kock, Oakland, Calif., assignor to Leisure Dynamics, Inc., Minneapolis, Minn.
Filed Oct. 7, 1970, Ser. No. 25,368
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D42—8

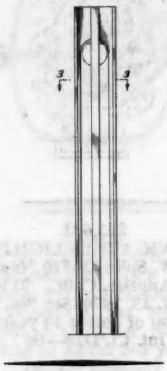


223,631
AIRCRAFT NAVIGATION LIGHT INDICATOR
Lloyd W. Spiro, 20510 Napa St., Los Angeles, Calif. 91306
Filed Sept. 23, 1970, Ser. No. 25,167
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32

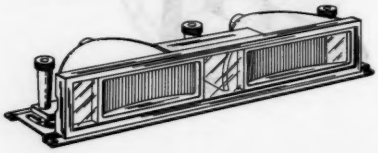


223,632
LIGHT STANDARD OR SIMILAR ARTICLE
Robert W. Selden, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Original design application Oct. 20, 1969, Ser. No. 19,634. Divided and this application July 2, 1970, Ser. No. 23,804
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

223,633
LIGHT STANDARD OR SIMILAR ARTICLE
Robert W. Selden, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Original design application Oct. 20, 1969, Ser. No. 19,636, now Patent No. 220,531, dated Apr. 20, 1971. Divided and this application Aug. 24, 1970, Ser. No. 24,651
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

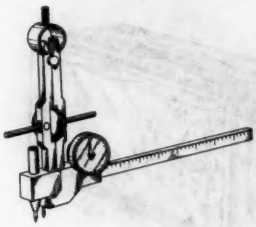


223,634
HOUSING FOR AUTOMOTIVE LAMP OR THE LIKE
Pierre Cibie, Paris, France, assignor to Projecteurs Cibie, Bobigny, Seine-St.-Denis, France
Filed Dec. 1, 1969, Ser. No. 20,324
Claims priority, application France May 30, 1969
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32



223,635
BUBBLE LEVEL
Wing G. Lew, Los Angeles, Calif., assignor of a fractional part interest to Jack Bazz, Lynnwood, Calif.
Filed July 1, 1970, Ser. No. 23,788
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6

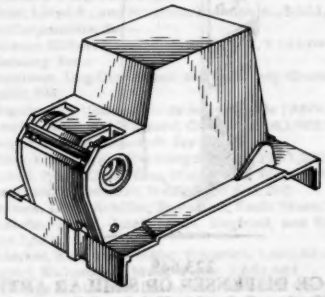
223,636
CALIBRATED COMPASS
Richard O. Finley, 2608 Graham Ave., Apt. C, Redondo Beach, Calif. 90278
Filed Feb. 4, 1971, Ser. No. 112,849
Term of patent 14 years
Int. Cl. D10—*04;* D19—*06*
U.S. Cl. D52—6



223,637
CRADLE SUPPORT FOR A CAMERA
Harry E. Mazur, Los Angeles, Calif.
(2280 Araby Drive, Palm Springs, Calif. 92262)
Filed June 10, 1970, Ser. No. 23,417
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1

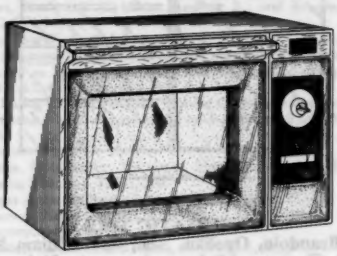
223,638
UNIVERSAL TRIPOD
David B. Smith, 42 Ridgedale Ave., Madison, N.J. 07940
Filed Feb. 1, 1971, Ser. No. 23,861
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1

223,639
AUDIO-VISUAL CARTRIDGE FOR A STRIPFILM PROJECTOR
Frank C. Badalich, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Sept. 24, 1970, Ser. No. 25,183
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1



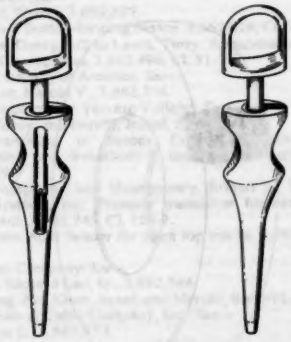
223,640
LETTER HOLDER
Margaret J. Kemp, 6006 Baudry, Houston, Tex. 77035
Filed Feb. 26, 1971, Ser. No. 119,438
Term of patent 14 years
Int. Cl. D19—*099*
U.S. Cl. D74—2

223,641
PORTABLE MICROWAVE OVEN OR SIMILAR ARTICLE
Thomas J. Binzer, Charles H. Schmitt, and Peter H. Wooding, Jefferson County, Ky., assignors to General Electric Company
Filed Aug. 26, 1970, Ser. No. 24,702
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—4

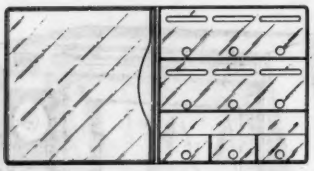


223,642
BARBECUE COOKER
Roger T. Shaper and John E. Germann, Houston, Tex., assignors to Metal Window Products, Inc.
Filed Aug. 6, 1970, Ser. No. 24,349
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—10

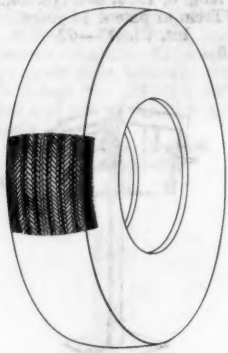
223,643
SYRINGE
Luis H. Tejera, Central Islip, N.Y., assignor to Mallinckrodt Chemical Works, St. Louis, Mo.
Filed June 10, 1970, Ser. No. 23,423
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—12



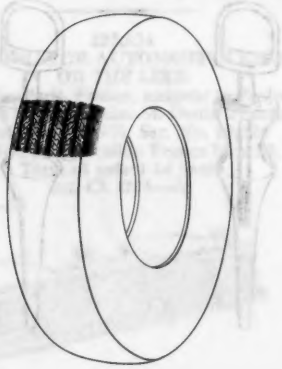
223,644
TRAVEL CASE FOR MEMENTOES OR THE LIKE
Alexander Croon, Hans-Carossa-Strasse 5, Stockdorf, near Munich, Germany
Filed Mar. 9, 1970, Ser. No. 21,800
Claims priority, application Germany Dec. 18, 1969
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—1



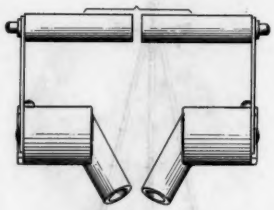
223,645
PNEUMATIC TIRE
Dale J. Beaudoin, Opelika, Ala., and William K. Pope, Mount Clemens, Mich., assignors to Uniroyal, Inc., New York, N.Y.
Filed Sept. 8, 1970, Ser. No. 24,879
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



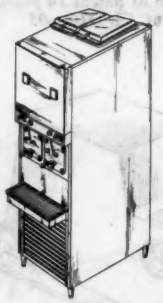
223,646
PNEUMATIC TIRE
William K. Pope, Mount Clemens, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed Oct. 28, 1970, Ser. No. 25,705
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



223,647
DOUBLE FLAVOR DRINK DISPENSING VALVE UNIT OR SIMILAR ARTICLE
Richard T. Cornelius, Minneapolis, Minn., assignor to The Cornelius Company, Anoka, Minn.
Filed June 23, 1970, Ser. No. 23,633
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3



223,648
BEVERAGE DISPENSER OR SIMILAR ARTICLE
Robert B. Hartley, Columbia Heights, Minn., assignor to The Cornelius Company, Anoka, Minn.
Filed Nov. 9, 1970, Ser. No. 25,903
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3



223,649
BEVERAGE DISPENSER OR SIMILAR ARTICLE
Robert B. Hartley, Columbia Heights, Minn., assignor to The Cornelius Company, Anoka, Minn.
Filed Nov. 9, 1970, Ser. No. 25,902
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Boeters, Karl-Ernst; Streit, Klaus; Conzelmann, Gerhard; Schmid, Hermann; and Fleischer, Hans-Joachim, to Bosch, Robert, G.m.b.H. Fuel injection arrangement for internal combustion engines. 3,662,720, Cl. 123-32.

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Brand, William J., to Varian Associates. Cryostat having heat exchanging means in a vent tube. 3,662,566, Cl. 62-514.

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Braten, Olaf Georg. Press cages on screw presses. 3,662,679, Cl. 100-127.

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Broecker, Bernhard, to Reichhold-Albert-Chemie Aktiengesellschaft. Process for the production of binders for aqueous coatings. 3,663,485, Cl. 260-19.

Broecker, Bernhard, to Reichhold-Albert-Chemie Aktiengesellschaft. Method of making vinyl-modified synthetic resins, based on polyether esters, which are capable of being thinned with water. 3,663,487, Cl. 260-23.

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Petersen, John Valdemar Brammer; and Clauson-Kaas, Niels, to Geigy Chemical Corporation. Method for preparing alkali metal salts of 3-hydroxy-2-oxo-1(2H)-pyridine-sulfonic acid. 3,663,556, Cl. 260-294.8

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Peterson, Marvin A., to General Electric Company. Process for producing polyamide coating materials. 3,663,510, Cl. 260-65.

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Polk, James A. Circular function teaching aid. 3,663,732, Cl. 35-34.

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Pollitzer, Ernest L.; and Hilfman, Lee, to Universal Oil Products Company. Gasoline producing process comprising hydrocracking and reforming. 3,663,425, Cl. 208-60.

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Poon, Yull Gunn. Structure for housing animals. 3,662,714, Cl. 119-18.000

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Poucher, Michael; Brooks, Leslie John; and Morris, Geoffrey William, to Rolls-Royce Limited. Gas turbine engine. 3,662,556, Cl. 60-226.00r

Powell, David B., to General Electric Company. Switchgear draw-out apparatus with clutch interlock. 3,663,773, Cl. 200-50.0aa

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Praisler, Ladd C. Device for preventing mud or dirt splatter against windows and sides of a building. 3,662,503, Cl. 52-97.000

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Preiter, Alfred, to Grapha Maschinenfabrik Hans Muller AG. Tipping apparatus for a signature gathering machine. 3,663,007, Cl. 270-55.000

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Selden, Robert W., to Weyerhaeuser Co. Light standard or similar article. 223,632, 5–16–72, Cl. D48—931.
Selden, Robert W., to Weyerhaeuser Co. Light standard or similar article. 223,633, 5–16–72, Cl. D48—31.
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1 3,662,405

CLASS 4
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116.4 3,663,158
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104.3SN 3,662,421
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250.22 3,662,426
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3,662,576
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1.11 3,663,735
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1.26 3,6 63,737
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CLASS 94
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236CC 3,663,231
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52 3,663,245
53 3,663,246
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58 3,663,248
75 3,663,249
84 3,663,250
90 3,663,251
104 3,663,252
204 3,663,253
271 3,663,254
279 3,663,281
285 3,663,255
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CLASS 132

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53 3,662,768
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CLASS 133

5R 3,662,770

CLASS 134

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CLASS 135

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543.19 3,662,761
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CLASS 144

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CLASS 151

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CLASS 162

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CLASS 164

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113 3,662,811
193 3,662,812
273 3,662,813
283 3,662,814
292 3,662,815
366 3,662,816

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51 3,662,820
89 3,662,821

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.6 3,662,823
72 3,662,824
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152 3,662,825
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295 3,662,831
302 3,662,832
312 3,662,828
314 3,662,833
3,662,834

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94R 3,663,741
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5.4MA 3,663,745
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7.92 3,663,753
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CLASS 182

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CLASS 184

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180 3,662,875
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50AA 3,663,773
86.5 3,663,772
144B 3,663,775
166C 3,663,777
166H 3,663,776
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168G 3,663,779
172R 3,663,781

CLASS 203

15 3,663,375
91 3,663,382

CLASS 204

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30 3,663,377
43 3,663,384
49 3,663,378
56 3,663,379
59 3,663,380
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213 3,663,410
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243R 3,663,411
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272 3,663,416
275 3,663,413
290F 3,663,414
299 3,663,415
301 3,663,417
314 3,663,418

CLASS 206

3 3,662,877
19.5C 3,663,432
45.33 3,662,878
65E 3,662,879

CLASS 208

8 3,663,420
3,663,421
28 3,663,422
59 3,663,423
3,663,424
60 3,663,425
65 3,663,426
87 3,663,427
97 3,663,428
108 3,663,429
111 3,663,430
143 3,663,431
210 3,663,434
213 3,663,433

CLASS 209

73 3,662,880
3,662,881
111.5 3,662,882
111.7 3,662,883
129 3,662,884
161 3,662,885
250 3,662,886

CLASS 210

44 3,663,435
131 3,662,887
167 3,662,888
169 3,662,889
195 3,662,890
242 3,662,891
3,662,892
315 3,662,893
330 3,662,894
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523 3,662,897
525 3,662,896

CLASS 211

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CLASS 213

1R 3,662,899

CLASS 214

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1C 3,662,904
6FS 3,662,902
6B 3,662,900
6H 3,662,901
16.1CD 3,662,905
41 3,662,906
77R 3,662,907
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83.3 3,662,908
302 3,662,910
334 3,662,911

CLASS 219

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10.55 3,663,783
69E 3,663,784
69M 3,663,785
69V 3,663,786
3,663,787
76 3,663,788
79 3,663,789
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107 3,663,791
121EM 3,663,794
121LM 3,663,793
121P 3,663,792
121 3,663,795
211 3,663,796
3,663,797
242 3,662,892
464 3,663,798
523 3,663,799

CLASS 220

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CLASS 221

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CLASS 222

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55 3,662,923
64 3,662,924
80 3,662,925
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CLASS 224

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CLASS 226

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CLASS 228

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15 3,662,940
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CLASS 229

2.5 3,662,943
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52B 3,662,946

CLASS 233

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92V 3,663,803
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CLASS 238

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77.5AT 3,663,514
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168 3,663,675
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244 3,663,679
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299 3,662,693
310 3,663,682
346 3,663,683

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CLASS 270

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CLASS 302

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237 3,663,080

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CLASS 316

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Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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1 : 3,662,555	3,662,874	3,663,379	3,663,933	3,663,866	3,662,479
3,662,587	3,662,888	3,663,388	3,663,934	3,663,919	3,662,486
3,662,877	3,662,891	3,663,395	3,663,935	3,663,920	3,662,488
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3,662,985	3,662,911	3,663,431	8 : 3,662,427	3,663,167	3,662,559
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3,663,860	3,662,945	3,663,452	3,662,890	3,663,250	3,662,631
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18 : 3,169

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